POSTERS' SESSION

POSTERS' SESSION PS31
CARDIOVASCULAR RISK FACTORS

PP.31.01 TEN-YEAR BLOOD PRESSURE TRAJECTORIES, CARDIOVASCULAR MORTALITY AND YEARS OF LIFE LOST IN TWO COHORTS: THE MINNESOTA BUSINESS AND PROFESSIONAL MEN STUDY AND THE ZUTPHEN STUDY

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Objective: To characterize 10 year trajectories of annual blood pressure (BP) measurements and to examine these trajectories in relation to CVD mortality and years of life lost.

Design and method: We used data from two prospective cohorts, the Minnesota Business and Professional Men Study (266 US men) and the Zutphen Study (672 Dutch men). BP was measured annually during 1947 1957 in Minnesota and 1960-1970 in Zutphen, a time when only very high levels of BP were treated. For each cohort, BP trajectories were identified by finite mixture group-based trajectory modelling. Cox proportional hazards and linear regression analysis were used to examine baseline BP level and BP trajectories in relation to CVD mortality and years of life lost (based on age at death). Associations were adjusted for age, serum cholesterol and smoking.

Results: In both cohorts, mean age at baseline was 50 years. During an average follow-up of 20 years, all Minnesota men died (of whom 53% from CVD) and 98% of the Zutphen men died (of whom 45% from CVD). Mean age at death was about 80 years in both cohorts. Each 50 mmHg difference in baseline systolic BP was associated with a 1.5 to 2 times higher CVD mortality risk and 3 6 years of life lost. We identified four trajectories for systolic BP and diastolic BP in both cohorts. Mean systolic BP of the four trajectories increased from 0.4 to 2.1 mmHg/year. The highest-level systolic BP trajectories were associated with a 3-to-4 times higher CVD mortality risk and 6-10 years of life lost, compared with the lowest-level trajectory. Similar patterns were observed for diastolic BP.

Conclusions: In two independent male cohorts from the US and the Netherlands, similar 10-year BP trajectories were identified that appeared to be better predictors of CVD mortality and years of life lost than BP level at middle age.

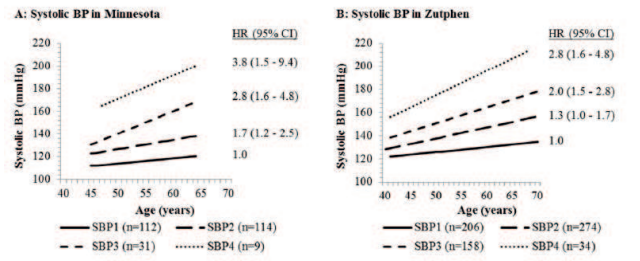

Figure Trajectories of systolic BP with corresponding hazard ratios (HR) and 95% CI for CVD mortality in 266 men participating in the Minnesota study (A) and 672 men participating in the Zutphen Study (B).

PP.31.02 ANALYSIS OF PATIENTS WITH ARTERIAL HYPERTENSION DEPENDING ON CHANGES IN AMBIENT TEMPERATURE

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Objective: To determine the impact of heat waves on the blood in patients with arterial hypertension.

Design and method: The study included 19 patients with arterial hypertension at the age of 58±12 years. All patients underwent ambulatory blood pressure monitoring (SpaceLabs 90207, SpaceLabs Healthcare , USA). To characterize the degree of the anomalous fields of air temperature was used coefficient of the anomalous equal to a mean-square value of the normalized temperature anomalies (averaging over the square). In July 2013, the temperature anomaly in the European territory of Russia amounted to +1.84°C. Analysis of the studied indexes held in summer during normal for period temperature in July 2012 (visit 1), and this same group of patients with abnormally high temperature in July 2013 (visit 2).

Results: Analysis of the data of 24-hours ambulatory blood pressure monitoring significant differences in the level of average, average daily, average nightly systolic blood pressure (BP) were not revealed. However, at visit 2 there was a trend to increase of average daily systolic BP (129,1±15.5 mm Hg vs 124,1±8.9 mm Hg). Also found a significant increase of average daily diastolic BP (80,6±18 vs 70,7±9 mmHg, $p<0.05$). Significant changes of average, average nightly diastolic BP were not revealed. When comparing pulse BP at visit 1 and 2 - significant changes were not revealed, but it tended to increase (41,8±18, 7 mm Hg vs 48,1±15,8 mmHg). Significant changes in heart rate also not observed. While on visit 2 patients are often complained of weakness, sweating, and dizziness (21% vs 47%, respectively). All patients were instructed about the required changes in lifestyle for a period of abnormally high air temperature. Increasing the frequency of cardiovascular complications were not revealed.

Conclusions: During the heat wave, patients with hypertension will require more careful monitoring to prevent the development of the cardiovascular complications. The absence of significant changes in our study may be connected with the insufficient number of examined patients. The obtained results require further study.

PP.31.03 YOUNG HYPERTENSIVE MALES WITH AN EXCESSIVE NOCTURNAL BLOOD PRESSURE LOWERING MAY BE AT HIGH RISK OF SUDDEN CARDIAC DEATH

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Objective: Hypertension (HT) has been shown to increase the risk of sudden cardiac death (SCD). Electrical myocardial instability, clinically presenting with severe ventricle arrhythmias, is the common cause of SCD. Signal-averaged high resolution ECG (SA-ECG) has strong electrical cardiac instability predictive value. This technique allows detecting and assessing potentials of slow myocardial depolarization (late ventricular potentials, LVPs), which are known as an independent risk factor of SCD and all-cause cardiovascular mortality. We aimed to evaluate LVPs in young hypertensive patients with different types of diurnal BP patterns.

Design and method: 125 males [mean age 23.4±6.7 (18–27) years; 35 (28%) grade 1 HT, 45 (36%) grade 2 HT, 45 (36%) grade 3 HT; HT duration 4.5±0.9 years; 100% with no previous antihypertensive treatment] underwent estimation of LVPs (TotQRS >114 ms; LAS40 >38 ms; RMS40 <20 μV) by recording SA-ECG (PolySpectr®) and 24-hour BP monitoring (BPLab®).

Results: LVPs were found in 32 patients (25.6%), 93 (74.4%) were LVPs-negative. There were no significant differences between the parameters of 24-h BPM in the groups of patients with and without LVPs, as well as in the recording of LVPs in patients with varying HT grades. Increased detection rate of LVPs was associated with an impaired diurnal BP pattern – the over-dipper type (Table). Even the isolated excessive nocturnal diastolic BP lowering was followed by worse SA-ECG parameters.
24-h BPM and SA-ECG parameters in young hypertensive males with different diurnal BP patterns (M±m)

	SBP DI, %	DBP DI, %	Tot QRS, ms	LAS40, ms	RMS40, µV
Dipper (n=41)	13.1±0.4	13.9±0.3	95.6±1.8	31.4±2.1	38.9±3.2
Non-dipper (n=20)	4.6±0.8***	7.1±0.6**	96.3±2.1	33.9±1.5	34.4±2.4
Over-dipper (n=22)	24.1±0.8***	27.1±0.6***	101.8±1.2*	38.4±1.6*	20.9±2.5**
Non-dipper SBP/ dipper DBP (n=20)	5.9±0.8**	13.9±0.7	93.6±1.9	32.1±2.1	40.2±2.4
Dipper SBP/over-dipper DBP (n=22)	14.4±0.5	23.2±0.8***	104.2±2.1*	38.6±2.4*	24.9±1.9*

DI, diurnal index; * p<0.05, ** p<0.01, *** p<0.001 differences with the dipper group. The findings were also supported by the correlations found between the parameters of SA-ECG and the values of 24-h BPM.

Conclusions: Young hypertensive males with an excessive nocturnal BP (systolic and/or diastolic) lowering have more LVPs – SCD predictors.

PP.31.04 AMBULATORY BLOOD PRESSURE IN RELATION TO VITAMIN D SUPPLY AND SODIUM INTAKE

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Objective: Dietary sodium and increased activity of the renin-angiotensin system (RAS) are known to contribute to hypertension. Vitamin D has been implicated in the proximal regulation of the RAS. The majority of observational data suggest that lower levels of vitamin D may be associated with a higher blood pressure (BP) and increased risk of developing hypertension, although conflicting studies exist. We aimed to assess whether vitamin D and sodium intake interact to influence BP values over 24 hours.

Design and method: The study group included 154 subjects recruited from general population. Office BP was measured at 2 separate visits, 5 times at each visit. SpaceLabs 90207 oscillometric monitors were programmed to measure ambulatory BP each 15 min. daytime (6.00 – 22.00) and each 30 min. nighttime. Sodium intake was assessed based on 24-hour urinary sodium excretion. Vitamin D (25(OH)D3) concentration was measured in serum.

Results: The study group included 72 men and 82 women, mean age = 48±14.9 years, 93 subjects had hypertension. Average 24-hour urinary sodium excretion was 159.3±67.6 mmol/24h and vitamin D level was 19.5±9.8 ng/ml. With adjustments applied for age, sex, body mass index, life style and antihypertensive treatment, serum vitamin D correlated negatively with office systolic (beta=-0.15; p=0.24) and diastolic BP (beta=-0.15; p=0.085), but did not reach statistical significance. Similarly, we did not detect significant correlations between serum vitamin D and ambulatory BP. In the models additionally adjusted for 24-hour urinary sodium excretion, negative correlation between vitamin D and BP became significant for office systolic (p=0.02) and diastolic (p=0.04) BP, and for 24-hour systolic (beta = -0.17; p=0.04) and daytime systolic (beta = -0.19; p=0.023) BP. The interaction term between serum vitamin D and 24-hour urinary sodium excretion was not significant in relation to any office or ambulatory BP value (p>=0.4).

Conclusions: In our study group, serum vitamin D concentration was related to blood pressure values only in the models additionally adjusted for urinary sodium excretion. These observations suggest that the action of vitamin D on blood pressure might depend on the individual sodium intake.

PP.31.05 CARDIOVASCULAR RISK FACTORS: FOCUS ON ARTERIAL HYPERTENSION

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Objective: To investigate the prevalence of hypertension and its treatment efficiency in the Ryazan region of Russia.

Design and method: The study included persons aged 25-64 at the time of the survey , signed an informed consent. They conducted a survey on a standardized questionnaire, ECG, measurement of endothelial function, measurement of blood pressure, heart rate, waist circumference, height, weight, intake of biological samples to determine the biochemical profile of risk. Risk assessment using the SCORE scale adapted for the Russian Federation.
The study was included 1622 persons (1220 and 402 urban-rural population), of which 42.6% [750] were men, 53.8 % [872]-female.

Results: The prevalence of hypertension was 45.9% [744], among the urban population-49.3% [198] of the rural population-44.8% [546]. The average age of the population studied in the city was 47.5 (46,3-48,5) years, rural-47,9 (46,5-49,3). Differences in the sex composition of groups of rural and urban populations have been identified. Mean SBP/DBP was higher in the city than in rural areas (141.8/90.4 vs. 135.4/83.6 mm Hg, p<0.001).
At the risk of developing hypertension, according to our data, influenced : smoking (relative risk (RR) 1.23, 95% confidence interval (CI) 1,11-1,37), obesity (1.93; 1,73-2,14), endothelial dysfunction (1.42; 1,15-1,75), diabetes (1.34; 1,16-1,54). Factors such as excessive alcohol consumption, salt consumption and passive smoking were not associated with the development of hypertension. 81.7% [608] hypertensive patients taking drugs . Of these , 55.8% were [339], and 44.2% of women [269] men. Patients who lived in the city took drugs in 82.2% [448] cases in rural areas-80.8% [160].
Effectively treated 41.0% [305] patients. Equally effective control of their blood pressure, men and women (50.1 % of the total number of men/women). In the city the percentage of individuals entering the target value was higher at 54.0% against 39.4% in rural areas (p=0.002).

Conclusions: The prevalence of hypertension in the Ryazan region is somewhat higher than in Russia, however, is characterized by a high percentage achieve target BP (41.0%). However, despite this third of patients have a high or very high 10-year risk of fatal.

PP.31.06 PREVALENCE AND MODE OF TREATMENT OF HYPERTENSION IN RAFSANJAN

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Objective: Hypertension is the most common cause of outpatient visit and also one of the most important major risk factors of cardiovascular disorders. In my country few studies have been done to determine prevalence of hypertension in the past. We designed this study to detect the prevalence and mode of treatment of hypertension in our city, Rafsanjan, Islamic Rrepublic of Iran.

Design and method: This cross-sectional community base study in 2013 was performed on 510 participants over 20 years old in Rafsanjan (229men and-281women).The sample was chosen using randomized cluster method. The expected prevalence of hypertension was about 20% so the sample size was estimated to be 400 participants and for a safe margin final sample of 510 was enrolled.

Results: The mean age of participants was 42.59 years. The overall prevalence of hypertension was 24.5 %(27.5%in men and 22.1% in women).The proportion of hypertensive people increased significantly in older groups, for example this rate was 48.4% in people older than 60 years and 10.2% in 20-29 age group. The most common drug group is used was beta blocker and in this group atenolol was the first choice. Other groups were angiotensin receptor blockers, converting enzyme inhibitors, diuretics and calcium channel blockers.

Conclusions: Hypertension is a very common and also controllable risk factor in our community .Our population is going to become old and well designed programs are mandatory for managing this risk factor. According to our result the most common drug for treatment of hypertension is beta blocker and changing the practice of physician is also mandatory, because nowadays beta blockers are not the first line for treatment of hypertension.

PP.31.07 INFLUENCE OF THE BRONCHOOBSTRUCTIVE DISEASE ON PARAMETERS OF CARDIOVASCULAR IN PATIENTS WITH ARTERIAL HYPERTENSION

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Objective: To evaluate impact of bronchoobstructive disease (BD) in patients with arterial hypertension (AH) on ECG parameters: heart rate (HR), ventricular and supraventricular ectopic activity.

Design and method: 60 male and female with AH aged from 34 to 77 were enrolled during a visit to the doctor. Group 1 consisted of 30 patients with AH and comorbidity BD (12 patients with COPD and 18 patients with BA), group 2 consisted of 30 patients with AH. All patients underwent 24-hour Holter ECG recording and ambulatory blood pressure 24-monitoring. Results are presented as Mean±std.

Results: There were no differences between the mean values of systolic

(132,6±13,7 mmHg vs 127,9±13,4 mmHg; p=0,1) and diastolic blood pressure (83,1±8,8mmHg vs 79,3±8,1mmHg; p=0,17). By contrast, the HR in patients with AH and comorbidity BD was higher than in patients with AH (71,3±8,8 bpm vs 66,8±5,8 bpm; p=0,03). Based on the results of 24-hour Holter ECG recording mean, minimal and maximal HR,total number of supraventricular extrasystoles were higher in group 1, then in group 2 (71,4±8,8 vs 66,8±5,8, p<0,05; 54,7±7,8 vs 49,6±5,6, p<0,05; 121,5±16,4vs 111,7±16,5, p<0,05; 1031±3003 vs 86,31±117, p<0,05), respectively.

Conclusions: Patients with cardiorespiratory diseases have higher heart rate, supraventricular ectopic activity compared to patients without BD. High cardiovascular risk occurs in patients with AH and BD. The fact of presence of BD should be considered during the management of patients with AH.

PP.31.08 CHRONIC OBSTRUCTIVE PULMONARY DISEASE AND ITS ASSOCIATION WITH CARDIOVASCULAR RISK FACTORS AND COMORBIDITY

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Objective: Chronic obstructive pulmonary disease (COPD) is characterized by an excessive inflammatory response towards noxious particles and gases, such as cigarette smoke. COPD patients often present with comorbidities such as cardiovascular disease. Our aim is to assess the prevalence of cardiovascular risk factors and comorbidities in a group of patients with COPD.

Design and method: Patients with known COPD were included. Variables like age, sex, smoking, presence of hypertension, type-2 diabetes, heart failure, ischemic coronary disease, peripheral artery disease, cerebrovascular disease, atrial fibrillation, chronic kidney disease, and Charlson comorbidity index (CCI) were reported.

Results: A total of 519 patients with COPD were included. Mean age: 74.9 (range 30-98) years old. Men: 348 (67.1%), women 171 (32.9%). Prevalence of the variables analyzed were as follows: smoking (active or former) 326 (62.8%); ischemic coronary disease 176 (34%); peripheral artery disease 75 (14.5%); cerebrovascular disease 64 (12.3%); hypertension 312 (60.1%); atrial fibrillation 168 (32.4%); type-2 diabetes mellitus 131 (25.2%); chronic kidney disease 91 (17.5%); CCI 4.93 (range 1-16) and CCI corrected by age 8 (range 1-19).

Conclusions: 1.- Most COPD patients included were men, relatively old and smokers.
2.- The most frequent cardiovascular associated disorder was hypertension, ischemic coronary disease and atrial fibrillation.
3.- About 1 each 4 patients had type-2 diabetes mellitus.
4.- Basal mean ICC was high in COPD patients, close to 5, but it increases up to 8 when corrected by age.

PP.31.09 APELIN AS A MARKER OF CARDIAC REMODELING IN PATIENTS WITH ESSENTIAL HYPERTENSION WITH LEFT VENTRICLE REMODELING

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Objective: Apelin 12 plays an important role in cardiovascular homeostasis. However lots of pathogenetic links remain unclear.
To investigate levels of apelin-12 and nitric oxide pool in patients with essential hypertension according to left ventricular mass index (LVMI).

Design and method: 60 patients (pts) with essential hypertension of 1 and 2 grade were examined. Diagnosing, cardiac echocardiography (M- and B-mode, calculation of LVMI) was done according ESH 2007, 2009 guidelines. Apelin-12 plasma levels were detected using ELISA (Phoenix pharmaceuticals). Endothelial nitric oxide synthase (eNOS), NO2, NO3 were discovered biochemically. 15 healthy volunteers present control group. Pts were divided according LVMI: 1gr. – with LV hypertrophy; 2gr. – without LV hypertrophy.

Results: Groups were age matched: 1 gr. – 58.02±6,61 years, 2gr. – 54,74±9,22 (p<0,05). Systolic blood pressure (BP) was higher in pts with LV hypertrophy: 1 gr. – 160,68±17,41, in 2 gr. – 149,64±21,91 (p<0,05). Diastolic BP in 1gr. – 96,13±9,44; 2gr. – 92,70±14,79. Apelin levels in pts without LV hypertrophy exceed levels of pts with LV hypertrophy. 1 gr. - 0,321±0.25 ng/ml, 2 gr. – 0,374±0,29 ng/ml (p<0,05). eNOS in 1 gr. - 0,606±0,99; 2 gr. - 0,621±0,11 (p<0,05); NO2 and NO3 in 1 gr. - 11,50±2,27 and 18,83±3,82 correspondently; in 2 gr. - 12,21±2,17 and 20,02±5,30. In the group with LV hypertrophy there correlations were revealed: apelin – systolic AP (R=0,53); apelin-NO2 (R=0,54); apelin-relative LV wall thickness (R=0,53); apelin-interventricular septum thickness (R=0,64).

Conclusions: Apelin activity increases with nitric oxide activation. In patients with essential hypertension and left ventricular hypertrophy apelin and NO pool levels were lower than in pts without hypertrophy. Possible, that apelin operates via nitric oxide system and may play protective role in cardiovascular remodeling at initial stage.

PP.31.10 CARDIOVASCULAR RISK FACTORS IN HYPERTENSIVE PATIENTS: COMPARISON BETWEEN PATIENTS' PERCEPTION AND PHYSICIANS' MEASUREMENT OF SOME CARDIOVASCULAR VARIABLES

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Objective: Objective of the study was to evaluate the awareness of hypertensive patients about their cardiovascular risk factors. Data were collected in 1.320 hypertensive subjects (men age 61 ± 24 years, 611 female) consecutively referred to our Hypertension Center during one year.

Design and method: The data, collected through a self-explaining questionnaire, were compared with the measurement of the same variables, obtained during the visit (body weight, height, blood pressure, heart rate) or through the hospital data base (metabolic profile, renal function, left ventricular hypertrophy, thickening or plaques of the carotid arteries) or from patients' record-files (Home BP, ABPM). In this preliminary analysis we have evaluated systolic and diastolic BP, pulse rate (PR) body weight and height.
BP and PR values, as assessed through home-BP (HBP) measurements, were compared with automated office BP (AOBP, average of the last 5 over 6 automated readings) or daytime Ambulatory BP (ABP) values.
The analysis refers to 724 individual who presented with reliable HBP record (at least 2 readings per week, morning and evening measurements, during the last 3 months, on stable treatment) in whom both AOBP and daytime ABP were available.

Results: The comparison of BP values are reported in the Table.

Table

	HBP	AOBP	ABPM (daytime)
Sysytolic BP mmHg ± SD	137 ± 19	134 ± 18	136 ± 17
Diastolic BP mmHg ± SD	79 ± 18	77 ± 17	74 ± 16
Pulse rate bpm' ± SD	74 ± 17	73 ± 16	76 ± 17

This data indicate that there was a very close correlation between HBP and both AOBP and daytime ABP values (p <0.025, Pearsons' test) when BP is routinely checked at home. On the contrary, in the patients who did not perform a reliable HBM measurement, the agreement between automated measurements an their perception of BP control resulted quite low (49 % of the subjects who reported mean BP levels < 140/90 mmHg presented with normal AOBP or ABP values).
As far as anthropometric variables are concerned, hypertensive patients tended to underestimate body weight (average – 6,7 Kg) and overestimate height (+ 2.7 cm).

Conclusions: These data indicate that patients should be encouraged and fully instructed to measure BP at home in reliable fashion. The risk stratification through anthropometric variables, should be assessed by reliable measurements of body weight and height during the medical examination.

PP.31.11 INFLUENCE OF HIGH SALT DIET ON HIF-1ALPHA AND ANTIOXIDATIVE ENZYMES MRNA EXPRESSION IN BLOOD VESSELS OF YOUNG MALE SPRAGUE-DAWLEY RATS

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Objective: Recent data on Dahl Salt-Sensitive rats demonstrated decreased Cu/Zn- and Mn-superoxide dismutase protein expression in cerebral vessels, leading to increased oxidative stress and impaired vasodilator responses. High salt diet (HSD) per se increases vascular oxidative stress, and the high levels of superoxide increase hypoxia-inducible factor 1-alpha (HIF-1α) protein expression in kidneys. The aim of this study was to assess the influence of feeding 3 weeks

old rats with HSD (4% NaCl) for 1 week on HIF-1α mRNA expression in blood vessels and its relationship to antioxidative enzymes gene expression.

Design and method: 3-weeks old healthy male Sprague-Dawley rats (N=6), after weaning were divided into 2 groups: 1-week-HSD group and an age and sex matched control group fed with standard rat chow (0.4% NaCl). Following diet protocol, rats were sacrificed and their aorta and cerebral blood vessels harvested for HIF-1α, Cu/Zn SOD, MnSOD, EC-SOD and glutathione-peroxidase 1 and 4 (GPx1, GPx4) mRNA expression analysis by Real-time PCR. Data were analyzed using REST 2009 software and $p<0.05$ was considered significant.

Results: 1-week-HSD rats presented with significant downregulation of Cu/Zn SOD (P=0,014), MnSOD (P=0,002) and EC-SOD (P= 0,037) genes in cerebral blood vessels, and EC-SOD in aorta (P=0,005) compared to control group. GPx4 mRNA level was significantly decreased in aorta (P=0,019) and cerebral blood vessels (P=0,018) of 1-week- HSD rats compared to control group. There was no significant difference in GPx1 gene expression between the groups. HIF-1α expression in cerebral blood vessels was 5,25 (P=0,003) fold higher in 1-week-HSD rats compared to control group.

Conclusions: Our results imply that HSD induces downregulation of antioxidative enzyme genes' in blood vessels of very young rats. These effects are immediate, resulting in decreased mRNA level of SODs and GPx4 already after 7 days of HSD. Parallel to these changes we found increased HIF-1α expression, suggesting possible mutual transcriptional regulation.

PP.31.12 PLASMA HOMOCYSTEINE LEVELS AND PREVALENCE OF CORONARY ARTERY DISEASE ARE HIGHER IN ESSENTIAL HYPERTENSIVE PATIENTS WITH METABOLIC SYNDROME

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Objective: Both metabolic syndrome and high plasma homocysteine levels are independent risk factors for the development of cardiovascular diseases. Experimental models have proposed that insulin influences homocysteine turnover. However, studies on the relationship between insulin resistance and homocysteine have given conflicting results and few studies have investigated this relationship in essential hypertension. The aim of this study was to evaluate the association between presence of metabolic syndrome and homocysteine levels in essential hypertensive patients and to verify whether plasma levels of homocysteine can predict the prevalence of cardiovascular events in presence of metabolic syndrome.

Design and method: In 562 hypertensive patients (53% males, age 56 ± 13 years) we evaluated generic anthropometric variables, smoking status, severity and duration of hypertension, renal function, glucose, insulin, and lipids metabolism, plasma levels of homocysteine, vitamin B12, and folic acid, and the prevalence of diabetes, coronary artery disease and cerebrovascular disease.

Results: Patients in the higher quartiles of homocysteine levels had higher plasma triglycerides, HDL cholesterol, and uric acid levels, higher prevalence of metabolic syndrome, coronary artery and cerebrovascular diseases, and lower creatinine clearance, vitamin B12, and folic acid levels. Homocysteine levels were independently associated with age, male gender, presence of MS, and folic acid levels. Patients with MS in the higher homocysteine quartiles had greater prevalence of coronary artery disease than patients in lower quartiles.

Conclusions: In essential hypertensive patients plasma homocysteine levels are independently associated to the presence of metabolic syndrome and high homocysteine levels might increase the risk of coronary artery disease in presence of metabolic syndrome.

PP.31.13 TRADITIONAL CARDIOVASCULAR RISK FACTORS ANDRENAL MICROCIRCULATION IN PATIENTS WITH ESSENTIAL HYPERTENSION

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Objective: Essential hypertension is a major risk factor for cardiovascular and chronic kidney disease. Renal resistive index (RI), measured by Doppler ultrasonography, is an excellent non-invasive indicator of renalvascular haemodynamics and renal function decline.Thepresent study sought to assess the relationship of RI with traditional cardiovascular risk factors and systemic haemodynamic loadmeasures in patients with essential hypertension.

Design and method: A total of 409 consecutive newly diagnosed, never treated patients with essential hypertensiongrade 1-3 (mean age 51±13 year, 52% males) referred to the outpatient antihypertensive unit of our institution were studied. Individuals with diabetesor overt cardiovascular or renal disease were excluded. The evaluation of cardiovascular risk factors and target organ damages was performed in accordance to the European Society of Hypertension guidelines. All patients underwent 24-hour ambulatory blood pressure monitoring (ABPM) and renal Doppler ultrasound with RI measurement(the mean value from both kidneys was used for the analysis).

Results: The mean±SD value of RI was 0.62±0.07 (0.64±0.06 in females vs. 0.60±0.06in males, $p<0.001$). The RI was significantly correlated with all traditional cardiovascular risk factors: age ($r=0.655$, $p<0.001$), smoking duration ($r=0.131$, $p=0.009$), history of dyslipidemia ($r=0.272$, $p<0.001$), LDL-Cholesterol ($r=0.172$, $p=0.001$), triglycerides ($r=0.129$, $p=0.013$), fasting plasma glucose ($r=0.174$, $p<0.001$), HbA1c ($r=0.207$, $p=0.001$) and GFR ($r=-0.431$, $p<0.001$). Moreover, RI presented significant negative associations with office diastolic BP ($r=-0.460$, $p<0.001$), office mean BP ($r=-0.292$, $p<0.001$) and office heart rate ($r=-0.292$, $p<0.001$) as well as 24-hour diastolic BP ($r=-0.428$, $p<0.0001$), 24-hour mean BP($r=-0.307$, $p<0.0001$) and 24-hour heart rate ($r=-0.273$, $p<0.0001$),significant positive associations with office and 24-hour pulse pressure ($r=0.461$, $p<0.0001$ and$r=0.436$, $p<0.0001$, respectively) and no association with office or 24-hour systolic BP($r=0.008$, $p=0.88$ and $r=0.061$, $p=0.232$, respectively). Besides, 24-hour, day and night diastolic pressure load was negatively associated with RI ($r=-0.397$, $p<0.0001$, $r=-0.427$, $p<0.0001$ and $r=-0.305$, $p<0.0001$, respectively).

Conclusions: In middle-aged hypertensive patients renal microcirculationis affected by all classical cardiovascular risk factors. Moreover, renal resistance appears to increasein the face of higher stoke volume (i.e.lower diastolic BP, mean BP and heart rate).

PP.31.14 IRBESARTAN IMPROVES MICROALBUMINURIA AND RENAL ARTERY RESISTANCE INDEX IN ARTERIAL HYPERTENSION

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Objective: The aim of this study is to evaluate the use of an angiotensin receptor blocker (Irbesertan) (I) for treatment of arterial hypertension (AH) with microalbuminuria and if may have capacity to protect patients against this organ damage.

Design and method: Uncontrolled patients attending to the Center of Hypertension of Cardarelli Hospital during 2011.12, with AH grade 2 and micoralbuminuira for at least 12 months were recruited. Ambulatory Blood Pressure monitoring (ABPM), renal artery resistance index and micro albuminuria measurements were performed. The angiotensin-converting-enzyme (ACE) inhibitors and the angiotensin receptorblockers (ARB) and other anthypertensive drugs were suspended and all were treated with Iresartan 300 mgr and Hydrocglorotiazide 25 mg once.day. Blood Pressure values (BP) were monitored monthly. ABPM and microalbuminuria were checked after one year.

Results: A total of 152 uncontrolled patients (86 female, aged 62.2±7,1) were enrolled.
Baseline systolic and diastolic BP were 161± 6 and 89± 6; after 12 months were 133± 5 and 83±4 respectively. Baseline mean MA was 76± 16 mg/L and at the end of the study 16±6 mg/L); the resistance index decreased from 0,71±2 (cm. sec) at the beginning to 0,66±3 after 12 months.

Conclusions: Our findings show that I significantly improved BP control rate in patients with hypertension grade 2. In addition these data confirm the effectiveness of I in eliminating almost completely MA and in reducing and controlling renal arteries resistance, improving and lowering the cardiovascular risk in these patients.

PP.31.15 AWARENESS, TREATMENT AND CONTROL OF MAJOR CARDIOVASCULAR RISK FACTORS IN A SMALL ITALIAN COMMUNITY

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Objective: Hypertension, hypercholesterolemia and diabetes are the main causes of cardiovascular diseases, however these conditions are still poorly recognized and treated. This study aimed at estimating the prevalence, awareness, treatment and control rates of major cardiovascular risk factors in an unselected sample of individuals of small community located in Northern Italy.

Design and method: We screened 344 sequential subjects in this study. Data collection included family and clinical history, anthropometric data, blood pressure, blood glucose and cholesterol. Individual cardiovascular profiles were assessed by risk charts of the "Progetto Cuore".

Results: 78.2% of subjects had hypercholesterolemia (total cholesterol levels >190 mg/dl), 61% had central obesity (waist circumference > 94 cm for man and 80 cm for women), 51.2% were hypertensive (blood pressure> 140/90 mmHg), 8.1% had diabetes (blood glucose>126 mg/dl), 22.7% had impaired fasting glucose (blood glucose 100-125 mg/dl), and 35.5% were overweight (BMI 25-29 kg/m²). Alcohol drinkers and smokers accounted for 46.2% and 22.4% of subjects, respectively. Awareness of hypertension, hypercholesterolemia and diabetes was poor, and control of these risk factors was even worse. Prevalence of high blood pressure, high serum cholesterol, overweight and obesity significantly increased with aging. Hypercholesterolemia and obesity were significantly more common in women, while overweight and diabetes in men. In 15.4% of partecipants the risk of the major cardiovascular event in the next 10 years was either high or very high.

Conclusions: In a small healthy community the prevalence of major cardiovascular risk factors is high, while awareness, treatment and control are poor. These results suggest that we need more screening campaigns of informations to improve early diagnosis and access to treatment for an effective prevention of cardiovascular diseases in the general population.

PP.31.16 HTA, AS A RISK FACTOR HIGHLIGHTS IN PATIENTS SUFFERING PCR

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Objective: Know the main risk factors, determinants and outcomes of patients diagnosed with cardio -respiratory arrest (CPA) in our environment.

Design and method: A retrospective study of patients diagnosed with PCR is performed (on admission to hospital and / or ICU) between January 2010 until 31 December 2013 inclusive. We reviewed 453 summaries, of which only correspond to actual PCR 405 patients (89%).

Results: In 74 % of cases the etiology was cardiac ($p < 0.0131$), with 80 % PCR outpatient (home and public place) and 20% hospital ,73.8% men and 27%women, mean of 63 years. Women average 5 years older than men ($p < 0$, 059). Among the highlights risk factors hypertension, a major factor is found in more than half of the sample, 67 % of cases: of which 53 % of patients had been diagnosed previously, while the remaining 14 % was diagnosed during hospitalization. As the second most important risk factor is smoking 42 % of cases, followed by DM diagnosed at the time of the event, 26 % of patients and dyslipidemia present in 22% of them. Significant differences in gender were found, noting that males were more smokers and drinkers, however, had less hypertension frequently. Of all hypertensive patients, 27% were male versus 40 % female.
53% of cases had a history of previous heart disease (Coronary 25.3 %, valvular disease 10%, 5 % DCM 5% hypertrophic cardiomyopathy, congenital diseases 1%). The initial rhythm in most patients was ventricular fibrillation in 83 % of cases, compared to 20 % with asystole.

Conclusions: The main FR present in most patients with PCR is the HTA. It is confirmed that a percentage of the population is not HT aware of their condition, noting a predominance in women. The PCR has a poor prognosis in the short and medium term, occurring mainly in patients with previous heart disease, hence the importance of control of CVRF.

PP.31.17 DO THE SOCIOECONOMIC AND HYPERTENSION GRADIENTS IN RURAL POPULATIONS OF LOW- AND MIDDLE-INCOME COUNTRIES DIFFER BY GEOGRAPHICAL REGION? A SYSTEMATIC REVIEW AND META-ANALYSIS

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Objective: To assess the association between socioeconomic status (SES) and hypertension in rural populations of low- and middle-income countries (LMICs) and determine whether the association between SES and hypertension in these settings differs according to geographical region.

Design and method: Through database searches we identified population-based studies that presented risk estimates for the association between SES or any of its proxies and hypertension. Meta-analyses were conducted using a random-effects model in Stata software. Publication bias was assessed using funnel plots and Begg's tests.

Results: Generally, no significant association was observed between educational status and hypertension whereas a positive association was observed with income. Interestingly, educational status was inversely associated with hypertension in East Asia (effect size (ES) 0.82 [95% confidence interval (CI) 0.78, 0.87]) but positively associated in South Asia (ES 1.28 [95% CI 1.14, 1.43]). Additionally, higher income, household assets or social class were positively associated with hypertension in South Asia (ES 1.14 [95% CI 1.09, 1.21]) whereas no significant association was observed in East Asia and Africa. Compared to other occupations, being a farmer or manual labourer was significantly associated with a lower risk for hypertension.

Conclusions: We provide evidence that the association between hypertension and SES in rural populations of LMICs varies according to geographical region. This has important implications for targeting intervention strategies aimed at high risk populations in the different geographical regions.

PP.31.18 EFFECTS OF OCCUPATIONAL STRESS INDEX AND DIFFERENT WORK STRESSORS ON CARDIOMETABOLIC RISK FACTORS AND WORKING ABILITY IN HYPERTENSIVE WORKERS IN SOUTH SERBIA

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Objective: In this difficult economy, many of people are finding it harder than ever to cope with stress in the workplace. The aims of our study were to investigate occupational stress index and influence of different work stressors on cardiometabolic risk factors and working ability in hypertensive workers in South Serbia.

Design and method: The total of 817 individuals who work as professional drivers (city bus drivers, car and truck drivers), construction workers, production line workers and bankers were included in this study. Workers who suffered arterial hypertension (total of 504) composed examined group (40 to 60 years of age, majority were males) and 313 age and sex matched workers without hypertension composed control group. We analyzed in details work stressors by using questioners with 79 different factors and Occupational Stress Index (OSI) was calculated with permission of dr Belkic. We made comparisons regarding the total burden, as well as the nature of the occupational stress burden (Underload, High demand, Strictness, Extrinsic Time Pressure, Aversive/Noxious Exposures, Threat-avoidant vigilance/disaster potential, Conflict/uncertainty).

Results: Total OSI was significantly higher in examined group compared to controls ($p<0001$). Highest OSI was calculated in professional city bus drivers (88.66±3.89), bankers (87.47±3.47) while production line workers had OCI of 60.20±3.23, $p<0.001$.). Conflict as stress dimension was higher in examined group (14.48±7.05 vs 9.57±4.43; $p<0.001$); as well as extrinsic time pressure, high demand, strictness and noxious exposures ($p<0.001$). There was a linear correlation between blood pressure levels and total OSI greater then 40, ($r= 0.603$, $p=0.002$). Lipid levels were higher in examined group ($p<0.001$) and linearly correlated with OSI ($p<0.001$). Glucose levels were higher in bankers in comparison to professional drivers and production line workers, $p<0.001$. Better working ability correlated with lower OCI.

Conclusions: Hypertension appearance in working population is related to high OSI which in turn is related to higher cardiometabolic risk. Further steps are needed to reduce the level of work stressor and provide a better quality of live in working population.

PP.31.19 ASSESSMENT OF VASCULAR PHENOTYPING IN PATIENTS AT CARDIOVASCULAR RISK

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Objective: Cardiovascular risk is a continuum, and discriminating between patients at high and low risk can be difficult and impede clinical decision-making. The accurate assessment of cardiovascular risk remains a daily challenge for clinicians. Screening for the presence of subclinical organ damage may provide additional benefits in predicting cardiovascular events. We aimed to assess the agreement of markers of organ damage with traditional risk scoring methods.

Design and method: We performed a comprehensive analysis of vascular health on a cohort of 50 patients recruited from Blood Pressure and Cardiovascular Risk Factor clinics. This included pulse wave analysis, pulse wave velocity, carotid intima-media thickness, brachial flow mediated dilatation and ankle-brachial pressure index. Patients were subdivided into low, intermediate and high cardiovascular risk according to the ASSIGN score.

Results: Pulse wave velocity (8.63, 8.25 and 11.9 m/s) and carotid intima-media thickness (0.67, 0.73 and 0.91 mm) were the only vascular parameters to display a statistically significant ($p<0.001$) difference according to risk category (low, intermediate and high). Both correlated with age (pulse wave velocity: $r=0.589$, $p<0.001$; carotid intima-media thickness: $r=0.646$, $p<0.001$) and with each other ($r=0.585$, $p<0.001$). Using 95% confidence intervals to estimate the normal reference ranges for these parameters, we identified 6 low risk, 11 intermediate risk and 6 high risk patients who had test values outwith the ranges expected of their risk category. Of those in the intermediate category, 8 participants had results lower than expected, with 3 having results higher than expected.

Conclusions: Pulse wave velocity and carotid intima-media thickness were the only markers to distinguish between low and high risk patients. These detect aortic stiffness and pre-clinical atherosclerosis respectively. We identified patients who had higher or lower values than expected according to their risk category. This could indicate higher or lower cardiovascular risk than originally calculated. These findings would require to be tested prospectively.

PP.31.20 AGE, SMOKING, HYPERTENSION AND FEMALE GENDER ARE DETERMINANTS OF VASCULAR AGING EVALUATED BY SECOND DERIVATIVE OF DIGITAL PHOTOPLETHYSMOGRAPHY

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Objective: To evaluate the cardiovascular (CV) risk factors related to arterial function indexes obtained by the second derivative of digital photoplethysmography (SDPTG) in employees of a private educational institution in a large city of Brazil.

Design and method: The clinical and anthropometric data were obtained in 239 individuals from 23 to 72 years (average 40.1 ± 9), 106 women/133 men. Measures of blood pressure (BP) were done by an automatic device Microlife®. The SDPTG was automatically recorded by the Dynapulse® device with the sensor located on the second digit of the right hand; SDPTG waves a, b, c, d in systole and e in diastole, and its relations were obatained. The ratios b/a and d/a and a vascular aging index (IPA) = ((b-c-d-e)/a), respectively, arterial distensibility marker, intensity of reflection waves and vascular age were automatically calculated. Individuals were considered with high rates if they had higher than average values plus the standard deviation. Arterial hypertension (AH) was defined as PA >= 140x90 mmHg on examination or referred by the patient.

Results: In a logistic regression analysis, the possibility of high IPA was positively and independently related with age 50 > years (Odds Ratio-OR = 16.5), smoking (O.R. = 3.0), AH (O.R. = 2.9) and female gender (O.R. = 4.2); elevated b/a ratio with age 50 years > (O.R. = 8.0), while d/a ratio related with female gender (O.R. = 4.0) and smoking (O.R. = 2.2). Elevated vascular age was independently related to age > 50 years (O.R. = 11.7), female gender (O.R. = 3.1), smoking (O.R. = 2.3) and AH (O.R. = 2.5).

Conclusions: Vascular indices obtained by SDPTG are influenced by the main CV risk factors. The arterial distensibility (b/a) is related to age while intensity of reflection pulse wave (d/a) has influence of smoking and female gender. The vascular aging suffers influences of AH, smoking and age.

PP.31.21 IMPACT OF OBESITY ON TARGET ORGAN DAMAGE AND METABOLIC PROFILE OF PATIENTS WITH SEVERE ARTERIAL HYPERTENSION

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Objective: Arterial Hypertension (AH) and obesity are often associated and the impact of obesity on complications of severe hypertension is still not very studied. Objectives: to evaluate the impact of obesity on target organ damage, biochemical markers and modifiable risk factors of patients with severe AH admitted into tertiary hospital.

Design and method: Retrospective study from data obtained in 341 patients consecutively enrolled in outpatient tertiary hospital in the period from April 2010 to March 2012. The blood pressure was measured following guidelines recommendations by automatic devices.

Results: In the entire group, 53% women, mean age 52.9±14 years, blood pressure 160 ± 29/98 ± 17 mmHg under prescription of more than 2 medications. The average BMI was 29.5±5 kg/m2, 37% overweight, 22% grade I obesity, 15% grade II obesity and 4% grade III obesity. Patients with overweight and obesity had lower levels of HDL (55,4±28 vs. 46±14 vs. 43,1±12, $p < 0.01$) and among obese patients, the triglyceride level was greater than in the group with normal weight (114,4±80 vs. 143±83 vs. 168±109, $p < 0.01$). The modifiable risk factors, BMI was higher in sedentary individuals (30.5±6 vs. 27±4 kg/m2, $p < 0.01$) and lowest among smokers (27,9±5 vs 30,1±6kg/m2, $p < 0.01$). The obese presented, on echocardiogram, larger left atrium (36,8±0,9 vs. 37,3±0,6 vs. 40,9±0,6; $p<0,01$) and diastolic left ventricular diameter (48,1±1,0 vs. 51,2±0,7; $p<0,01$) than those with normal weight or overweight. There was no association between BMI and renal injury markers (creatinine and glomerular filtration rate).

Conclusions: Patients with severe arterial hypertension have high prevalence of obesity and overweight (78%), with a significant impact on the cardiac and metabolic consequences of these patients. The data reinforce the need for a multidisciplinary team approach of patients with this clinical profile.

PP.31.22 INTRA CLASS CORRELATION COEFFICIENTS OF CARDIOVASCULAR RISK FACTORS IN THE INDIAN URBAN POPULATION

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Objective: The method of cluster sampling is used widely in population based interventions and surveys are limited by statistical efficiency due to within cluster correlation. The intraclass correlation coefficient (ICC) which is a major determinant of sample size is generally assumed based on estimates from a few studies carried out in the West which may not be applicable to other contexts.
Objectives: The present communication aims to provide estimates of intraclass correlation coefficients for selected behavioural, anthropometric, clinical and biochemical factors by using the data collected from a representative group of Indian urban population.

Design and method: A cluster sampling method was used to select a population above 30 years of age from urban Delhi. Hypertension was defined as systolic blood pressure (SBP) greater than 140 mmHg and/or a diastolic blood pressure (DBP) greater than 90 mmHg or a history of current antihypertensive medication. Statistical association between quantitative and qualitative variables by gender were tested using independent samples- t / Mann Whitney U-test and chi-square test respectively. The ICC coefficients and 95% confidence intervals (CI) stratified by gender were estimated using random effect model approach.

Results: This study comprises of data from 3075 individuals (1363 males and 1712 females). We observed a statistically significant difference in mean SBP and DBP levels among males and females. The prevalence of hypertension is higher among males compared to females (38.8 vs 30.1%; p-value<0.001). Further females had lower mean levels for plasma glucose, triglyceride levels and TC:HDL compared to males. The ICC estimates ranges between 0.003 (triglycerides) and 0.48 (smoking status). The least ICCs obtained for SBP and DBP are 0.015 (95% CI: 0.003-0.027) and 0.056 (0.025- 0.086) respectively. Larger ICC estimates suggest that participants among urban populations were much more similar to each other than to participants between clusters.

Conclusions: This study bridges a major gap in the availability of ICC coefficients for urban population in India and would expect to improve the quality of epidemiological studies by providing more reliable estimates for the outcomes of future studies using cluster random sampling approaches.

PP.31.23 IS SYSTEMATIC CARDIAC REHABIILITATION EFFECTIVE FOR IMPROVEMENTS IN BLOOD PRESSURE CONTROL AFTER ACUTE CORONARY SYNDROME?

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Objective: Hypertension is a major risk factor for recurrent cardiovascular disease after acute coronary syndrome (ACS) and hence blood pressure (BP) control has high priority during cardiac rehabilitation.
The aim of the study was to evaluate the effect of two settings of cardiac rehabilitation on achieved blood pressure in a RCT set-up.

Design and method: Patients admitted with ACS were screened at 4 Hospitals in the Central Region in Denmark in 2012-13. Patients fulfilling eligibility criteria (18-80 years, EF>=40%, no prior rehabilitation) were randomized to receive phase II rehabilitation as either Hospital-based (H) or following a model of shared care (SC) with the general practitioner as coordinator. 24-hour ambulatory blood pressure (ABPM) was measured at baseline and 4 months later. Treatment targets were in all cases meticulously underlined in writing to the responsible physician. The recommended treatment target for hypertension was < 130/80 mmHg in this study.

Results: 212 patients accepted to participate in the trial and of these, 37% were treated with antihypertensive drugs already at admission.
In total either elevated SBP, DBP or both was present in 45% at baseline and in 49% at follow up.
RR for hypertension (SC vs H) at baseline 1.37 (95%CI: 1.00-1.87) and at follow-up 1.09 (95%CI: 0.82-1.45).

	Hospital	Shared Care	Total
Baseline (n with BP>130/80 mmHg / group)	38/99	51/97	89/196
Follow-up (n with BP>130/80 mmHg / group)	47/99	47/91	94/190
Baseline systolic blood pressure (mmHg)	125.4±2.8	127.8±2.8	
Change systolic blood pressure (mmHg)	+0.8±2.5	-0.2±2.4	
Baseline diastolic blood pressure (mmHg)	76.2±1.0	77.8±1.7	
Change diastolic blood pressure (mmHg)	+0.4±1.5	-0.7±1.3	

Conclusions: At the end of phase II cardiac rehabilitation, there were no difference between the groups, but almost half of patients was hypertensive. This emphasises the present difficulties of achieving BP control – even in a high risk patient trial group with carefully instructed nurses and physicians.

PP.31.24 THE EFFECT OF BREAST MILK CONSUMPTION DURING INFANCY TO CENTRAL AORTIC PRESSURE IN YOUNG ADULTS

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Objective: It is believed that breast milk intake causes a decrease in the risk of cardiovascular disease later in life. We investigate the the effect of breast milk consumption to central aortic pressure.

Design and method: To exclude other factors we recrutied fully healthy non-smoker young adults without any known risk factors for atherosclerosis. Healthy non-smoker volunteers between 18-35 years old are divided into two groups; which were never breast feeded and breat feeded for more than 6 months. Central systolic aortic pressures were investigated by an arteriograph(TensioMed, Budapest, Hungary) which works on ossilometric basis.Non-breast feeded group consists of 25 subjects (average age 28,0, %56 female, mean BMI 23,7), breat feeded group consists of 25 subjects (average age 27,3, %56 female, meam BMI 23,0).

Results: No significant difference was found between groups in terms of central aortic pressure values.Breast milk consumption during infancy does not have a significant effect to early atherosclerosis.

Conclusions: Breast milk consumption during infancy does not have a significant effect to an increase in central aortic blood pressure.

PP.31.25 CARDIAC ULTRASOUND PARAMETERS IN YOUNG MALES WITH PREHYPERTENSION AND THE FIRST STAGE HYPERTENSION DEPENDING ON CARDIOVASCULAR RISK LEVEL

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Objective: To compare the main ultrasound heart parameters in young males with prehypertension and the first stage of essential hypertension (JNC 7, 2003) who were belonged to the low or moderate category according to Framingham Cardiac Risk Scale.

Design and method: Examined 279 males without cardiovascular diseases (CVD), who had office blood pressure 120-159/80-99 mmHg. Subjects were divided into 2 groups depending on the level of CVD risk according to the Framingham criteria. The 1st group (low risk for CVD) included 103 men (average age is 35,6 ± 4,38 years), while the 2nd group (moderate risk for CVD) included 176 persons (average age is 37,7 ± 4,42 years; p>0,05). Body mass index of the 1st and the 2nd groups subjects amounted to 28,0 ± 4,68 and 29,2 ± 3,82 kg/m² respectively (p>0.05). The office systolic and diastolic blood pressure (mmHg) in the 1st group persons were lower than in the 2nd group ones (128,3 ±11,9 vs 144,9 ± 17,8; p<0,01; 84,1 ± 9,3 vs 94,1 ± 10,88; p=0,13). Cholesterol serum concentration in subjects of the 1st and the 2nd groups was: 4,99 ± 0,91 and 6,03 ± 1,13 mmol/L respectively (p<0,001). There were assessed values of some ultrasound heart parameters. All values are presented as mean ± standard deviation.

Results: Left atrium (LA, mm) and LV diastolic diameter (LVDD, mm), LV myocardium mass index (LVMMI, g/m²), LV ejection fraction (LVEF, %), LV relative wall thickness (RWT, units) in persons of the 1st and the 2nd groups did not differ significantly (LA: 36,14 ± 4,02 vs 36,86 ± 5,25; LVDD: 50,32 ± 5,39 vs 50,73 ± 5,06; LVMMI: 102 ± 27,4 vs 105 ± 18,3; RWT: 0,38 ± 0,07 vs 0,40 ± 0,07; p>0,05 for each parameter).

Conclusions: Young prehypertensive and mild hypertensive males without CVD, belonged to low or moderate level according to Framingham Cardiac Risk Scale, are characterized by normal values of main echocardiographic parameters.

PP.31.26 RELATIONSHIP OF OBESITY AND INFLAMMATORY MARKERS IN RESISTANT HYPERTENSION

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Objective: Obesity and hypertension are known as inflammatory diseases due to activation of immune system and production of inflammatory biomarkers such as interleukin-6 (IL-6), tumoral necrosis factor- α (TNF- α) and high- sensitivity C-reactive protein (HS-CRP). Indeed, HS-CRP levels are used to risk stratification in cardiovascular diseases. Resistant hypertensive patients (RHTN) have unfavorable prognosis mainly because poor blood pressure control despite of multiple anti-hypertensive drugs. Also, obesity is tightly related to this condition. However, it is unknown the profile of inflammatory biomarkers in RHTN in different degrees of BMI.

Design and method: Resistant hypertensive patients (n=101) were divided into three groups: normal weight (NW), overweight (OW), and obese (OB) in a cross-sectional study. Plasma levels of IL-6, TNF- α (ELISA) and HS-CRP (Nephelometry) were evaluated. Kruskal-Wallis test was used to compare the levels of inflammatory markers among the groups, whereas Speraman's correlation was used to analyze the association between the variables.

Results: No statistical differences were observed between the groups with respect to age, gender and body mass index. OB patients presented higher levels of TNF- α (mean ± SD) 4.95± 4.20 pg/mL compared to OW and NW (3.20 ± 2.66 and 3.07 ± 1.33 pg/mL, respectively) (p<0.05). Also, HS-CRP levels were increased in OB individuals (0.69 ± 0.74; 0.47± 0.49 and 0.26 ± 0.31 mg/L, respectively, p<0.05) and no differences were observed between IL-6 levels. In addition, HS-CRP was positively associated with BMI (r=0.37, p=0.002), but not TNF- α (r=0.018, p=0.06).

Conclusions: Higher levels of inflammatory markers were related with BMI in resistant hypertensive patients. These findings suggest that obesity may contribute to increased production of inflammatory biomarkers. Indeed, elevated levels of inflammatory markers concomitant with obesity are important factors associated with pathophysiology of RHTN.

PP.31.27 THE PREVALENCE OF CARDIOVASCULAR RISK FACTORS IN PATIENTS WITH RHEUMATOID ARTHRITIS

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Objective: Rheumatoid arthritis is a chronic multisystemic disease of unknown cause, which has affected 0.8% of the worldwide population.
Some data show that 20-25% of worldwide clinical cases with rheumatoid arthritis wouldn't happen if they didn't smoke.
The aim of this study is to evaluate the prevalence of cardiovascular risk factors (smoking, obesity, arterial hypertension, dyslipidemia, diabetes) in male and female patients with rheumatoid arthritis.

Design and method: The study was performed during the period of time 2009-2013 on 817 patients diagnosed with rheumatoid arthritis in the primary care units of Tirana, Albania. For each patient, we looked for the presence of comorbidities like hypertension, diabetes, dyslipidemia. We also calculated the Body Mass Index (BMI), based on individual weight and length. Obesity and smoking were considered as dicotomic variables (BMI >=30 obese versus BMI <30 not obese), (actual/past smoker versus non smoker).

Results: Smoking prevalence was 30.9% in males versus 16.3% in females. p<0.001
Dyslipidemia was more pronounced in males (28,1%) than in females (20.6%) p=0.019.
Obesity was more pronounced in females (37,9%) than in males (26.4%). p=0.025
Arterial hypertension prevalence was 29.9% in females and 26% in males. p=0.257
Diabetes prevalence was almost equal in males(11.1%) and females (12.1%). p=0.784
As we can see above, the results related to smoking, dyslipidemia and obesity were statistically significant, while the results related to arterial hypertension and diabetes were not statistically significant.

Conclusions: There seems to be an association between rheumatoid arthritis and cardiovascular risk factors.
Especially smoking, but also dyslipidemia and obesity are probable risk factors of rheumatoid arthritis.

PP.31.28 PREVALENCE OF COMORBID HYPERTENSION AND DYSLIPIDEMIA AND ASSOCIATED CARDIOVASCULAR DISEASE IN PATIENTS AT NEPHROLOGY AND HYPERTENSION OUTPATIENT (HASAN SADIKIN HOSPITAL, INDONESIA)

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Objective: The burden of cardiovascular disease (CVD) is increasing worldwide. The increase in the burden is a major concern in developing countries like Indonesia. It is well-established that hypertension and dyslipidemia are the two major contributing risk factors for CVD. Studies have consistently indicated that hypertension and hypercholesterolemia frequently coexist, causing what is known as dyslipidemic hypertension (DH). The risk of CVD associated with concomitant hypertension and dyslipidemia is more multiplicative than the sum of the individual risk factors. The co-existence of the two risk factors has more than an additive adverse impact on the vascular endothelium, which results in enhanced atherosclerosis, leading to CVD. The aim of study to investigate prevalence of hypertension and dyslipidemia and associated CVD in patients at Nephrology & Hypertension Outpatient Hasan Sadikin Hospital Bandung.

Design and method: A retrospective design was used to collect data between Januari 2013-Desember 2013. Based on these data the prevalence of hypertension and dyslipidemia were calculated.

Results: This study found that from 501 patients with hypertension, consist of 254 woman (50.69%) and 247 man (49.30%) with range of age 30-40 years old 145 people (28.94%), 40-50 years old 160 people (31.93%), 50-60 years old 125 people (24.95%), 60-70 years old 71 people (14.17%). We found the prevalence of hypertension with dyslipidemia was 150 woman (59.05%) and 128 man (51.82%). Prevalence of CVD was 55 woman (36.66%) and 128 man (61.71%).

Conclusions: This study estimated the prevalence of 2 chronic conditions (hypertension and dyslipidemia) with significant cardiovascular risk and found them to be common among patients in Hasan Sadikin Hospital. Identification of the burden of disease is essential for clinicians and managers to properly provide healthcare and manage resources. Further research is needed to quantitatively describe the increased risk of patients with multiple versus single cardiovascular conditions. The major policy implication of this research is that the accurate identification of the complete burden of disease including the presence of multiple chronic conditions, is essential to provide healthcare systems with the necessary information for resource allocation and provision of comprehensive disease management.

PP.31.29 SUBCLINICAL ATHEROSCLEROSIS IN MEN AT DIFFERENT LEVELS OF CARDIOVASCULAR RISK

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Objective: To assess subclinical atherosclerosis in men at different levels of cardiovascular (CV) risk.

Design and method: 200 patients aged 40-55 years without established cardiovascular disease were included in the study. Participants completed the lifestyle questionnaire. Anthropometric measurements, level of blood pressure, level of fasting glucose, triglycerides, fibrinogen, total cholesterol and subfractions were obtained. Evaluation of CVrisk was performed using SCORE. 132 patients underwent Doppler ultrasonography of carotid to measure intima-media thickness (IMT), duplex ultrasound scanning of peripheral arteries to measure ankle/brachial index (ABI) and coronary calcium (CC) scoring by multi-slice CT.

Results: Participants were divided into three groups. First group - CVrisk lower than 5% - 111(55,5%) participants, second – CVrisk from 5% to 9% - 57(28,5%) participants, third – CVrisk equal or more 10% - 32(16%) men. Analysis of additional CVrisk factors shows that hyperglycemia, hyperuricemia, hypertriglyceridemia, high level of fibrinogen and abdominal obesity were most frequently observed in patients at very high risk. Carotid IMT >0,9 was found in 40% of men at <5% risk, in 58,3% of men at high CVrisk and in 96,8% - at very high risk (p<0,01). ABI <0,90 was detected more frequent (p<0,01) in 62,5% of men at very high CVrisk and 41,7% of patients at high CVrisk than in group with CVrisk <5% (15,4% men). CCscore from 1 to 10 (low CVrisk) was detected in 19,2% of men in first group, in 37,5% of men in second group and 56,2% in third group; 13,5% of men in first group, and 16,7% of men in second group and 37,5% of men in third group had CC score from 11 to 100 (moderate CV risk); CCscore 101-400 was detected in 4,2% of men at high CVrisk and in 6,2% of men at very high CVrisk. The level of CVrisk had a correlation with CCscore (r = 0,29, p <0,01) and inverse correlation with decreased ABI (r = -0.38, p=0,001).

Conclusions: Patients at higher levels of CVrisk have metabolic risk factors and subclinical atherosclerosis more frequently, what is important in making decision of "aggressive" preventive measures.

PP.31.30 CARDIOVASCULAR RISK STRATIFICATION IN HYPERTENSIVE PATIENTS IN THE REGION OF BLIDA, ALGERIA

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Objective: Cardiovascular risk stratification in hypertensive patients treated according to established criteria in 2007 by (ESH/ESC).

Design and method: A total of 1748 hypertensive patients treated 52% female and 48% males with a mean age of 56.21 ± 10.60 years, examined between june 2011-December 2012). We evaluated: presence or absence of cardiovascular risk factors (CRF) and associated clinical conditions, subclinical organ damage (OD) by: echocardiography, carotid doppler, radial applanation tonometry, creatinine and glomerular filtration rate. Results expressed in absolute and percentage frequencies.

Results: 32% patients were low risk, 37% at medium risk, 23% at high risk and 8% at very high risk. Only 41% of hypertensives were controlled. The 50% of the sample had 1 or 2 risk factors, while 41% 3 or more, the dyslipidemia with a 64% the most prevalent factor. Presence of (OD) in the total sample: 32% with carotid intima-media thickness (IMT) > 0.9mm, with plaque 23%, left ventricular mass index (LVMI) increased by 36%, systolic blood pressure and aortic pulse pressure (AoSP and AoPP) increased by 56% and 34%, respectively, augmentation index increased by 13% and the index of large artery elasticity (C1) decreased by 46%.

Conclusions: The coexistence of cardiovascular risk factors different and the presence of subclinical organ damage, increased vascular risk of the hypertensive population and difficult to control.

PP.31.31 THE RELATION BETWEEN PULSE WAVE VELOCITY AND OBESITY IN ARTERIAL HYPERTENSION

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Objective: To evaluate the influence of various parameters of obesity and pulse wave velocity (PWV) in patients with essential arterial hypertension.

Design and method: 142 hypertensive patients (aged 59.7 ± 2.1 years, 67% obese hypertensives, without diabetes) were studied before and after 12 months

of antihypertensive treatment (ACEI/Amlodipine+Indapamide). Arterial stiffness was assessed by carotidian-femoral pulse wave velocity (Complior method). Obesity was defined using various parameters: body mass index (BMI), waist circumference, waist-to-hip ratio. The results were adjusted for components of cardiovascular risk profile (ANCOVA) and t-test was used for comparative analysis.

Results: PWV is related with BMI (t-test) only after adjusting for cardiovascular risk factors (r=-0.217, p=0.024). The same relation is still significant (p=0.016) when obesity is graded according to BMI (t-test). PWV strongly relates with waist circumference only in females (p = 0.011), but also in males after multivariate analysis. PWV is independently related to the waist-to-hip ratio (r = 0.177, p = 0.045, r2 = 0.031). After 12 months of antihypertensive treatment, PWV is still independently related to the waist-to-hip ratio (r = 0.23, p = 0.02), irrespective the regimen.

Conclusions: Our study suggests a complex interrelation between PWV, obesity and antihypertensive regimen. The waist-to-hip ratio independently influences the arterial stiffness in patients with essential arterial hypertension.

PP.31.32 ARTERIAL STIFFNESS AND CORONARY CALCIFICATIONS IN PATIENTS WITH HIGH RISK OF CARDIOVASCULAR DISEASE AND LOW BONE MINERAL DENSITY

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Objective: To evaluate the relationship between arterial stiffness, coronary calcifications and bone mineral density(BMD) in patients with high risk of cardiovascular disease (CVD) and osteoporosis.

Design and method: 46 patients (mean age 64.0 years, 82% of women) with high risk of CVD (SCORE>5), arterial hypertension (91%), hyperlipidemia (97%), smoking (35%), brachial artery atherosclerosis(91%), normal function of thyroid gland, without coronary artery disease, diabetes mellitus and second causes of osteoporosis. Pulse wave velocity between carotid and femoral sites (cfPWV, applanation tonometry), coronary calcifications (Agatston score, computed tomography), BMD at lumbar spine and femoral neck (DEXA) were assessed.

Results: There was no difference in cfPWV values between patients with osteoporosis (n=14), osteopenia (n=24) or with normal BMD (n=8). Patients with osteopenia had higher values of Agatston score compared with normal BMD patients (Med (min;max) – 49 (0;182) vs 0 (0;45) p<0.05). The prevalence of coronary calcifications was significaly higher in patients with osteopenia compared with normal BMD patients (81% vs 25%, p<0.05).

Conclusions: Low bone mineral density does not play role in arterial stiffness in patients with high risk of cardiovascular disease whereas it is associated with higher index of coronary calcification.

PP.31.33 ASSESSMENT OF RISK OF DEVELOPING HYPERTENSION IN YOUNG ADULTS

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Objective: According to World Health Organisation, a disease of the middle-aged is now being identified in younger age groups especially in high-risk populations. This underscores the need for mass awareness and screening programmes to detect high risk of developing hypertension at an early stage. For this purpose we have used a simplified Hypertension Risk Score for prediction of hypertension in undergraduate students.

Design and method: 148 undergraduate 1st MBBS students are scored using simplified Hypertension Risk Score which includes age, family history of hypertension, exercise status and Waist circumference. After scoring them they are categorised into mild, moderate and high risk group.

Results: We get 23% ,51% & 26% student in high risk, Moderate & Low risk group respectively for developing hypertension.

Conclusions: This underscores the need for further investigations to detect hypertension at an early stage and to overcome the disease burden of hypertension in future. Therefore prevention of obesity and promotion of physical activity will be future plan of action which can be suggested in the form of regular exercise and diet planning for the students as part of an integrated approach.

PP.31.34 SIGNIFICANT PROGNOSTIC MARKERS OF ARTERIAL HYPERTENSION FORMATION AND PROGRESSION

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Objective: One of the priorities in the fight against the incidence, morbidity and mortality from complications of hypertension (AH) is the development of new methods of diagnosis and prognosis of hypertension.
The purpose is selection of prognostic markers of hypertension formation and progression, using multivariate discriminate analysis.

Design and method: In conducting the discriminate analysis data of 238 patients with various stages of AH (group 1 - 74 patients with I stage: group 2 - 74 patients with II stage; the third group - 72 patients with III stage) were analyzed. Using ANOVA, we analyzed the effect of hypertension stage (independent variable) on 37 indicators (dependent variables), the list of which is composed of the following characteristics: anthropometry (height, weight, body mass index, waist circumference, hip circumference, waist/hip ratio), hemodynamics (systolic, diastolic pressure, heart rate), heart failure stage, concomitant cardiovascular diseases presence, clinical and laboratory parameters of carbohydrate metabolism (glucose, insulin, HbAc1, HOMA, Caro, Duncan), lipid profile (total cholesterol, triglycerides, LDL, HDL, apolipoprotein B), adipokines (interleukin-6, tumor necrosis factor-α, adiponectin, plasminogen activator inhibitor-1). All indicators were coded and distributed to 37-dimensional vector, which allows for the absence, presence, direction and magnitude of each indicator. The mathematical treatment of the results was performed using Microsoft Excel 2007 and SPSS Statistics 17.0.

Results: The most significant prognostic factors for cardiometabolic risk affecting arterial hypertension, and based on which a mathematical model predicting the formation and progression of hypertension is - the stage of heart failure, the degree of obesity, ischemic heart disease presence, the insulin resistance index Caro, the levels of HDL cholesterol, apolipoprotein B, interleukin-6, tumor necrosis factor-α, adiponectin.
The value of the canonical discriminant function coefficients represent the total contribution rate to the total risk of the formation and progression of hypertension in the course of certain sets of prognostic markers of cardiometabolic risk.

Conclusions: Definition of valid prognostic markers of cardiometabolic risk in patients with hypertension will valid predict the course of hypertension, total individual cardiometabolic risk based on mathematical calculation of individual prognostic markers for the patient.

PP.31.35 HYPERINSULINEMIA AND ADYPOKINES PROFILE IN PATIENTS WITH ARTERIAL HYPERTENSION AND OBESITY

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Objective: One of the most important indicator of carbohydrate metabolism disorders and also an independent risk factor for hypertension is elevated blood fasting insulin concentration.
Purpose is to study the role of hyperinsulinemia in the formation of adypokines profile disorders in hypertensive patients with concomitant overweight and obesity.

Design and method: The study involved 72 hypertensive patients (21 men and 51 women), mean age 59,39 ± 1,61 years with overweight and different obesity degrees, of which 31 patients with overweight, 19 - 1 obesity degree , 15 - 2 obesity degrees, 7 - grade 3 obesity. To evaluate the contribution of different levels of insulin (especially hiperinsulinemia) in the development of clinical and metabolic abnormalities in patients with hypertension and elevated body weight patients, were divided depending on the content of fasting insulin on 3 tertile. In the first tertile (n = 24) - insulin levels ranged from 2.43 to 10.11 mkU/ml, in the second (n = 24) - from 10.2 to 17.55 mkU/ml, in the third (n = 24) - from 17.66 to 46.87 mkU/ml.

Results: Comparison of anthropometric parameters revealed that the higher insulin levels associated with the higher waist circumference, BMI, and SBP. There were no statistically significant differences in DBP, HR levels, and lipid metabolism.
The following adipokines were assessed: TNF-α, IL-6 and adiponectin. The activity of TNF-α increased according to the increase in the concentration of insulin (9.26±1.74 pg/ml, 13.52±2.75 pg/ml, 18.44±5.05 pg/ml, respectively). According to our data the level of IL-6 in different insulin tertiles did not significantly differ (11.73±0.51 pg/ml, 11.24±0.71 pg/ml, 12.22±0.28 pg / ml, respectively).
The adiponectin characterized by decrease levels in 2 insulin tertile compared with 1 tertile (5.04±0.62 mg/ml vs 6.24±0.81 mg/ml, p<0.05) and more signifi-

cantly decreasein in 3 tertile were observed (4.32±0.76 mg/ml). These effects may explain the ability of insulin to reduce the synthesis of adiponectin, which promotes insulin resistance tissues.

Conclusions: Obtained results suggest that hyperinsulinemia in hypertensive patients with overweight and obesity related with of adipokines profile disorders. HyperTNF-alphaemia and hypoadiponectinemia result in progression of insulin resistance syndrome.

PP.31.36 FACTORS ASSOCIATED WITH MILD REDUCTION OF GLOMERULAR FILTRATION RATE IN A GENERAL INPATIENT UNIT IN SÃO PAULO, BRAZIL

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Objective: To identify factors associated with a mild reduction of estimated glomerular filtration rate (eGFR) in patients admitted to a general inpatient unit in São Paulo - Brazil.

Design and method: Cross-sectional, retrospective study conducted at the medical inpatient unit of a university hospital in São Paulo - Brazil. We estimated the eGFR of 281 randomly selected patients without personal history or medical diagnosis of kidney disease using the abbreviated Modification of Diet in Renal Disease (MDRD4) and the Chronic Kidney Disease Epidemiology Collaboration (CKD-EPI) formulas. We assessed the association between eGFR <90/ml/min/1.73m² and biosocial data and comorbidities. Significance level was p<0.05.

Results: Study sample was 50.2% female, 65.7% white, 52.7% unmarried, 39.8% active workers and aged 55.3 ± 18.9 years-old. The median and interquartile ranges of the eGFR were 93.9 (76.2 to 119.4) ml/min/1.73m ² for MDRD4 and 92.7 (74.2 to 114.5) ml/min/1.73m ² for the CKD -EPI. Relevant agreement was shown between eGFR classification by MDRD4 and CKD-EPI formulas (kappa 0.854). According to MDRD4, 54.4% had eGFR >=90 ml/min/1.73m²; 37.7%, eGFR 60-89 ml/min/1.73m²; and 7.8%, eGFR <60 ml/min/1.73m². Patients with eGFR <90 ml/min/1.73m² differed (p<0.05) from those with eGFR >=90 ml/min/1.73m² as being: older (63.4 ± 16 4 vs 48.5 ± 18.6 years-old), white (81.3 % vs 52.6 %), overweight (26.0 (23.4 to 28.7) vs 24.2 (20.6 to 27.6) kg/m²) and no smokers (21.5 % vs 36.5 %). Those with eGFR <90 ml/min/1.73m² also stood out as presenting hypertension (63.3 % vs. 32.0 %), diabetes (29.7 % vs 16.3%) and dyslipidemia (24.2 % vs. 7.2 %).

Conclusions: A mild reduced eGFR by the MDRD4 formula seemed to characterize patients without kidney disease in a general inpatient unit in São Paulo –Brazil regarding cardiovascular and renal risk factors.

PP.31.37 CARDIOVASCULAR RISK FACTORS ARE PREDICTORS OF CHRONIC KIDNEY DISEASE IN A GENERAL INPATIENT UNIT IN SÃO PAULO, BRAZIL

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Objective: To identify prevalence and factors associated with CKD among hospitalized patients in a general inpatient unit in São Paulo - Brazil.

Design and method: We conducted a cross-sectional retrospective study in the medical inpatient unit of a university hospital in São Paulo - Brazil. We randomly selected 826 medical records of patients admitted in 2009. We defined CKD as the presence of medical diagnosis or personal history. By means of a standardized questionnaire, we collected a number of clinical and demographic information and these variables were compared between patients with and without CKD. Significance level was p<0.05.

Results: We identified 105 individuals with CKD among the 826 charts reviewed for sample constitution, giving a prevalence of 12.7%. The final sample, 386 patients, was 50.5 % male, 64.4 % white, 50.7 % with a partner and age of 58.2 ± 18.6 years-old. Patients with CKD differed from patients without (p<0.05) regarding to: living with a partner (59.8 % vs 47.3 %), older age (65.8 ± 15.6 vs 55.3 ± 18.9 years-old), lower prevalence of current smoking (11.1% vs 29.7 %), personal history of hypertension (75.2% vs 46.3 %) , diabetes (49.5% vs 22.4%) , dyslipidemia (23.8% vs 14.9 %) , acute myocardial infarction (14.3% vs 6.0%) and congestive heart failure (18.1% vs 4.3%); death occurrence (12.4% vs 1.4%); and length of hospitalization (11 (8-18) vs 9 (6-12) days). The logistic regression analysis showed an independent association of CKD with the following variables (OR, odds ratio, CI, confidence interval 95 %): age (OR 1.019, CI 1.003 to 1.036), hypertension (OR 2.032, CI 1.128 to 3.660), diabetes (OR 2.097, CI 1.232 to 3.570) and congestive heart failure (OR 2.665, CI 1.173 to 6.056).

Conclusions: Established CKD was highly prevalent in patients admitted to a general inpatient unit in São Paulo- Brazil and was associated with the main modifiable cardiovascular risks factors, as well as ageing.

PP.31.38 THE INFLUENCE OF PRE-HYPERTENSION ON LONG-TERM MAJOR ADVERSE CARDIAC EVENTS IN PATIENTS WITH ACUTE MYOCARDIAL INFARCTION AND PRESERVED LEFT VENTRICULAR SYSTOLIC FUNCTION

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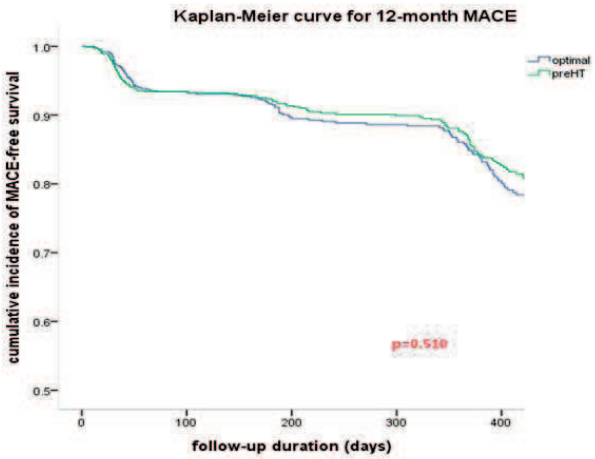
Objective: Pre-hypertension (HT) is known as an important predictor for incidence of coronary artery diseases. However, data about the independent prognostic value of pre-HT on long-term major adverse cardiac events (MACE) after acute myocardial infarction (AMI) with preserved left ventricular (LV) systolic function in a real clinical practice remains lack.



Design and method: Using data from Korea Working Group on Myocardial Infarction, a total of 2538 patients who were diagnosed with acute myocardial infarction, had no history of previous hypertension and whose LV ejection fraction (EF) was equal or higher than 45%. The eligible patients were classified into two groups according to initial systolic blood pressure (sBP) : optimal group (sBP<120 mmHg and diastolic BP (dBP) < 80 mmHg; n=1314, 51.8%) vs pre-HT group (120<=sBP<140 mmHg or 80<=dBP<90 mmHg; n=1224, 48.2%). We compared the baseline characteristics and the incidence of MACE which was defined as all cause mortality, repeated MI, revascularization and new onset heart failure in each group. In addition, we investigated the predictive value of pre-HT for MACE with multivariable Cox regression analysis.

Results: Patients in pre-HT group were younger, less male, and prescribed with beta-blockers more. The initial sBP was 104.4 vs 124.2 mmHg in each group (p<0.001). Their angiographic findings were not different. Total incidence of MACE was similar between the two groups, which was 15.8% and 14.5% in optimal and pre-HT group, respectively (p=0.413). Among individual component of MACE, only target vessel revascularization rate was marginally higher in pre-HT group (0.3% vs 1.0%, p=0.06). After adjusting confounding factors, pre-HT was not predicting 12-month MACE (HR 0.914, p=0.459). Only initial LVEF was a significant predictor (HR 0.982, 95% CI 0.967-0.998).

Conclusions: This study showed that the existence of pre-HT at admission was not associated with long-term MACE in HT-naïve patients with AMI and preserved LV systolic function.

PP.31.39 CHANGING IN BLOOD FLUIDITY, ONE MORE STEP TO ADAPTATION TO A HEAT?

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Objective: To investigate the influence of temperature on hemorheological properties of blood in 2 groups of patients (pts) with essential arterial hyperten-

sion (AH) and AH plus ischemic heart disease (AH+IHD) during hot summer days 2013 in Moscow.

Design and method: Whole blood viscosity at high (η1) and low (η2) shear rates, plasma viscosity (ηpl) were measured by a rotational viscometer (Low Shear 30 "Contraverse", Switzerland). Hematocrit (Ht) and aggregation of erythrocytes (η2/ η1) were studied also. The statistical analysis was carried out by nonparametric method of Spearman with STATISTICA 6. Pts were examined 3 times: in may 2013 with average monthly temperature (amt) 15.1C; July with amt 22.7 (average daytime temperature of air higher 29.0C); and September with amt 12.9C.

Results: It was shown that we have opposite results in 2 groups: if in AH-group viscosity indicators decrease, in AH+IHD group blood rheology parameters have a tendency to grow up (η1- % Δ -0,04% vs 0,02% respectively, p <0,06; Ht Δ -0,50% vs +0,55% respectively, p=0,06). In AH pts at peak of a heat decreased all other rheological parameters: viscosity of blood in the microcirculatory course η2/η1–p=0,02, ηpl–p=0.005, η1/η2–p=0,02, what produce blood flow increase, and as a result – adaptive acceleration of thermoexchange. With approach of a seasonal cold snap most of them came back to initial level.

Conclusions: our results confirm a hypothesis of significant influence of outdoor temperature on hemorheological properties of blood in pts with AH+IHD, what can be an additional risk factor for cases of ischemic attacks.

PP.31.40 CARDIOVASCULAR RISK ASSESSMENT USING THE FRAMINGHAM SCORE IN ARTERIAL HYPERTENSION

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Objective: Cardiovascular diseases are risk factors for coronary artery disease and arterial hypertension is the commonest. The objective of the study is to determine the cardiovascular risk of patients with arterial hypertension using the Framingham risk score.

Design and method: Cross-sectional, hospital-based study.
A total of 255 patients with arterial hypertension that are been followed up at the Cardiology clinic were enrolled into the study from August, 2012 to December, 2013. A structured questionnaire was used to collect the clinical, demographic and laboratory parameters of the patients. The Framingham coronary disease risk score was used to assess the risk of coronary events in the participants into low, medium and high risk.

Results: One hundred and forty three (56.1%) of the patients enrolled into the study were males and the male to female ratio was 1.2:1. The mean age, systolic blood pressure and high density lipoprotein cholesterol (53.63 ± 11.59, 149.67 ± 25.82, 1.07 ± 0.45) deferred significantly between the risk status of the hypertensives (p value = 0.000, 0.001 and 0.029) respectively. The risk of coronary events was low in 69.8%, with 18.0% showing medium cardiovascular risk and high risk occurred in 12.2% of the patients with arterial hypertension. The commonest risk factors were low high density lipoprotein cholesterol (58.6%) and poor blood pressure control in 67.8%.

Conclusions: Although, most of the hypertensives have low risk of developing coronary events in the next 10-years, the minimal high risk of developing it should not be ignored especially in a country in epidemiological transition. Public health awareness measures aimed at reducing these factors is hereby stressed.

PP.31.41 THE STATUS OF CARDIOVASCULAR RISK FACTORS AMONG MEN IN MALAYSIA: THE URBAN-RURAL DIVIDE

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Objective: Men have lower life expectancy compared to women globally and in Malaysia. They also have higher prevalence of medical conditions including cardiovascular diseases (CVD) and suffer more complications compared to women. CVD is the 2nd leading cause of death in Malaysian hospitals and the prevalence of CVD risk factors is especially high amongst men. This study aims to determine the cardiovascular risk profiles of the Malaysian men comparing the prevalence in the urban and rural populations.

Design and method: This community-based, cross sectional study involving 4943 men aged 30 years old and above was conducted in urban and rural areas in Malaysia between 2007 and 2010. Demographic data, anthropometric measurements (waist circumference, weight and blood pressure readings) and venous blood assays (glucose and lipid assays) were obtained. Data was analyzed using STATA version 11.

Results: Among the 4943 men, 52.7% were from the urban areas and 47.3% were from the rural areas. Mean age was 54.57 years (SD ± 11.19). The subjects consisted of 74.3% Malays, 9.6% Chinese, 3% Indians and 13.1% indigenous groups. In relation to the various CVD risk factors among the men, comparing the urban and rural population, it is illustrated in the Table 1 below:

CVD risk factors among the men	URBAN (%)	RURAL (%)	Significant (p<0.05)
Hypertension	50.1	51.7	0.269
Diabetes mellitus	20.9	13.9	<0.001
Smoker	22.3	31.6	<0.001
Elevated Waist Circumference	59.4	41.6	<0.001
Obesity	35.6	25.1	<0.001
Overweight	45.3	40.5	<0.001
Total cholesterol (≥5.2mmol/L)	69.2	58	<0.001
LDL (≥3.4mmol/L)	60.8	52.3	<0.001
Low HDL (≤1.0mmol/L)	40.8	39.7	0.432
TG (≥1.7mmol/L)	50.2	51.5	0.374

Table 1: CVD Risk Factors Among Men in Malaysia

Conclusions: Men from the urban areas had a significantly higher prevalence of CVD risk factors compared to those in rural areas. CVD risk factors assessment should be conducted routinely in men to reduce their cardiovascular morbidity and mortality.

PP.31.42 PREVALENCE OF METABOLIC SYNDROME AND ITS COMPONENT IN PATIENTS WITH CORONARY ARTERY DISEASE (ACUTE CORONARY SYNDROME)

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Objective: To evaluate the prevalence of Metabolic Syndrome and to evaluate its cardiovascular risk potential using the National Cholesterol Education Program's Adult Treatment Panel III Criteria.
Introduction: The Metabolic Syndrome is a cluster of risk factors associated with risk of Coronary Artery Disease Causing of morbidity and mortality in both developing and developed countries.

Design and methods: Total 209 patients with Coronary Artery Disease (Acute Coronary Syndrome) were enrolled. Patients having coronary bypass surgery in past, age less than 18 years and other co-morbid diseases were excluded. The definition of the Metabolic Syndrome was based on National Cholesterol Education Program's Adult Treatment Panel III criteria. All patients were assessed for the presence of five components of metabolic syndrome including Hypertension, High Density Lipoprotein-Cholesterol and Triglycerides, Glucose Intolerance and Abdominal Obesity, Systolic Blood Pressure, Diastolic Blood Pressure, Waist Circumference and Body Mass Index were measured. Echocardiogram, cardiac enzymes, fasting glucose and lipid profile were also done.

Results: A total of 209 patients of Coronary Artery Disease were studied with a mean age of 57.87±12.45 years (range 27-88 years). Metabolic Syndrome was present in 120 (57.4%) patients. Out of 120, male and female were 78(65.0%) and 42(35%) respectively. Significant difference (p<0.05) between male with metabolic syndrome and female with metabolic syndrome were found in smoking (p=0.004), hypertension (p=0.047), tobacco use (p=0.007), Triglyceride (p=0.014) and fasting blood glucose (p=0.05).

Conclusions: Metabolic Syndrome with five, four and three components was documented in 2.5%, 35% and 62.5% patients respectively. Only 31 (25.8%) patients with metabolic syndrome had diabetes mellitus, remaining 89 (74.2%) were non diabetic. Significant difference (p<0.05) between these two groups (metabolic syndrome and non-metabolic syndrome) were found in hypertension.

POSTERS' SESSION

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HEART FAILURE

PP.32.01 ACUTE EXPOSURE TO DIESEL EXHAUST INCREASES PULMONARY ARTERIAL RESISTANCE BUT DOES NOT ENHANCE PULMONARY HYPOXIC VASOCONSTRICTION

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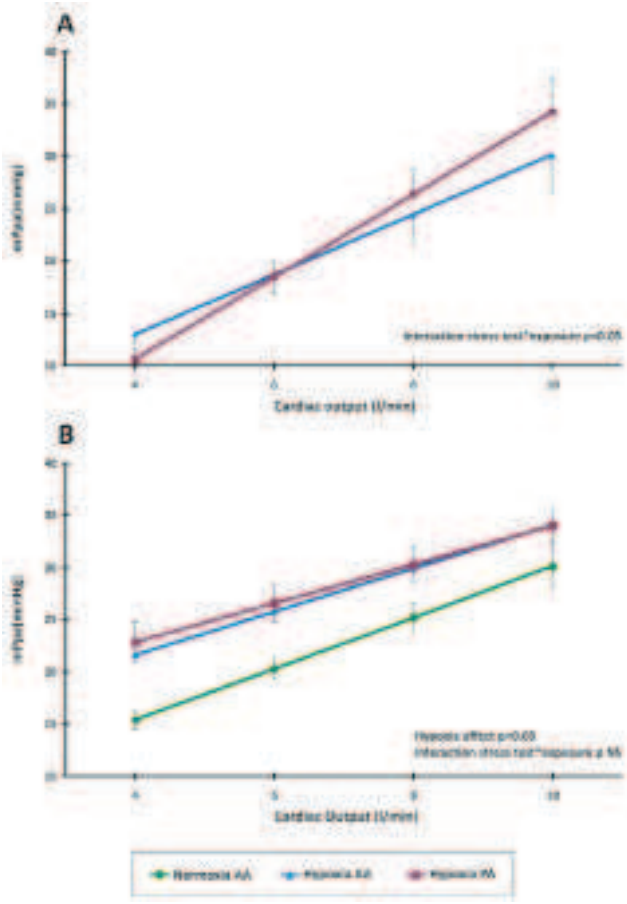
Objective: Air pollution was recently identified as an important risk factor for congestive heart failure. Some data suggest that polluted air exposure could affect pulmonary vascular function. No previous study has prospectively addressed the acute effect of polluted air on pulmonary vascular resistance (PVR) in resting and cardiac stress conditions. The aim of the study was to investigate the effects of acute exposure to diesel exhaust on PVR.



Design and method: Eighteen healthy male volunteers were exposed to ambient air and polluted air for 2 hours in a randomized, crossover study design. The effects on PVR, on the coefficient of distensibilty of pulmonary vessels, α, and on right and left ventricular functions were evaluated at rest (n=18), during dobutamine stress echocardiography (n=10), and during exercise stress echocardiography performed in hypoxia (n=8).

Results: At rest, PVR was the same in polluted air and ambient air. During dobutamine stress, PVR increased from 2.8±0.5 mmHg.min/l in ambient air to 3.9±0.5 mmHg.min/l in polluted air (Fig.A; $p<0.05$) and the coefficient α decreased from 0.96±0.15 to 0.64±0.12 %/mmHg ($p<0.01$). PVR increased from 3.9±0.2 in normoxia to 4.6±0.2 mmHg.min/l in hypoxia ($p<0.05$). Polluted air did not enhance the hypoxia-related increase in PVR (Fig.B). Polluted air did not affect ventricular function in any condition.

Conclusions: Acute exposure to diesel exhaust increases PVR by decreasing vessel distensibility. This pulmonary hemodynamic reaction is masked by an intense external hypoxic vasoconstrictive stimulus.

PP.32.02 EVALUATION OF THE ROLE OF PRENATAL CHRONIC HYPOXIA ON CARDIAC FUNCTION IN ADULT RABBITS OFFSPRING USING ECHOCARDIOGRAPHY

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Objective: To evaluate the role of prenatal chronic hypoxia on cardiac function in adult rabbits offspring via echocardiography.

Design and method: Sixteen New-Zealand rabbits were divided randomly into 2 groups: prenatal chronic hypoxia group (12% O2, n=8) and normal oxygen group (21% O2, n=8). After delivery, two male offspring of each maternal rabbit were selected and breast-fed for three months. Then they were randomly divided into high-fat diet and normal diet respectively. Therefore, four groups were included: Prenatal Chronic Hypoxia with High Fat Diet (n=8), Non-Prenatal Chronic Hypoxia with High Fat Diet (n=8), Prenatal Chronic Hypoxia with Normal Diet (n=8) and Normal Control (n=8). At six months of age, the offspring rabbits were undergoing echocardiography examination for left ventricular (LV) dimensions, shortening fraction, ejection fraction and Tei index, and cardiocyte caspase-3 activity detection.

Results: Prenatal chronic hypoxia induced a thickening of interventricular septum (main effect is 0.66mm, $P<0.01$), decrease in ejection fraction of left ventricle (main effect is –4.84%, $P<0.05$), increase of Tei index (main effect is 0.08, $P<0.01$) and cardiocyte caspase-3 activity (main effect is 0.47unit, $P<0.05$) in 6-mo-old prenatal chronic hypoxia offspring. All these effects were aggravated significantly when hyperlipemia was imposed ($P<0.05$).

Conclusions: Echocardiography is a useful tool to evaluation the role of prenatal chronic hypoxia on cardiac function in adult rabbits offspring. Prenatal chronic hypoxia leads to cardiac dysfunction in adult rabbits offspring. This effect is aggravated by hyperlipoidemia.

PP.32.03 ASTRAGALOSIDE IV IMPROVES LEFT VENTRICULAR DIASTOLIC DYSFUNCTION THROUGH INCREASING PHOSPHORYLATED- ENDOTHELIAL NITRIC OXIDE SYNTHASE

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Objective: There are no specific treatments for diastolic dysfunction, partly because of a relative lack of a mechanism understanding of this disorder. Recently, we showed that diastolic dysfunction was associated with cardiac oxidation and reduced nitric oxide (NO) production. Astragaloside IV (ASI), which is a saponin, has been also shown to ameliorate renal injury and enhance the activation of endothelial NO synthase (eNOS). We hypothesized ASI would improve cardiac relaxation, negating the deleterious effects of increased cardiac oxidative stress.

Design and method: We used the deoxycorticosterone acetate(DOCA)-salt mouse model, which demonstrates mild hypertension, myocardial oxidative stress, and diastolic dysfunction. Mice were divided into four groups,SHAM and DOCA control mice received sterile water ,ip, and other two groups SHAM+ASI and DOCA+ ASI that received ASI treatment 0.02 mg ASI/kg/day for 7 days after developing diastolic dysfunction at post-operative day 11. Mice were assessed by echocardiography. Endothelial NOS (eNOS) dimmer and phosphorylated- eNOS (p- eNOS) were assayed with cold SDS-PAGE western blot analysis under reducing conditions. High performance liquid chromatography (HPLC) analysis was used to measure cardiac superoxide and NO.

Results: DOCA mice exhibited diastolic dysfunction that was reversed after ASI treatment (E'/A' DOCA mice 0.62±0.19 vs. DOCA+ASI mice 1.27±0.29 ,P <0.001).The DOCA mice showed increased NOS-dependent superoxide production, reduced NO production, dephosphorylated eNOS and eNOS dimmer, but treatment with ASI improved eNOS dimmer and p- eNOS level, increased NO production(Nitrite/nitrate DOCA mice 2.57±1.28 vs. DOCA+ASI mice 3.33±0.62 umol/ mg protein ,P <0.05) and decreased superoxide production (2HE-OT DOCA mice 0.36±0.09 vs. DOCA+ASI mice 0.2±0.05 um/ mg tissue ,P <0.05). Isolated cardiomyocyte experiments revealed impaired relaxation that was normalized with ASI treatment.

Conclusions: Left ventricular diastolic dysfunction is secondary to reduced eNOS dimmer and phosphorylated- eNOS level, and ASI may increase NO production. And improve cardiac relaxation, negating the deleterious effects of increased cardiac oxidative stress.

PP.32.04 HEMODYNAMIC CHANGES IN PATIENTS WITH SEVERE CHRONIC HEART FAILURE AND ARTERIAL HYPERTENSION TAKING BISOPROLOL DEPENDING ON ARG389GLY BETA1-ADRENERGIC RECEPTOR GENE POLYMORPHISM

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Objective: To investigate the influence of Arg389Gly beta1-adrenergic receptor (β1AR) gene polymorphism on systolic, diastolic blood pressure (SBP, DBP) and heart rate (HR) in patients with severe chronic heart failure (CHF) and arterial hypertension (AH) taking bisoprolol during one year.

Design and method: Ninety nine patients (78 males and 21 females; mean age 61,7±0,96 years) with CHF, systolic dysfunction and AH were examined. Genotyping was performed to identify the individual β1AR Arg389Gly polymorphism by the restriction fragment length analysis of polymerase chain reaction products. The hemodynamic parameters (SBP and DBP, HR) were measured at the beginning and after one year. All patients received standard therapy of heart failure using bisoprolol. Continuous variables are expressed as median (25th, 75th percentile). For nonparametric comparisons, Mann-Whitney U test was used. All statistical tests were 2-tailed and p<0,05 was considered statistically significant.

Results: In the group of Arg389Arg carriers the SBP and DBP were decreased from 153 (140:160) to 137 (130:150) mm Hg and from 98 (82:100) to 88 (82:94) mm Hg, respectively (p < 0,05). SBP was decreased from 139 (120:160) to 125 (116:145) mm Hg and DBP from 87 (80:100) to 82 (76:88) mm Hg in Arg389Gly carriers (p < 0,05). The decrease of SBP from 140 (126:160) to 136 (120:145) mm Hg and DBP from 85 (80:100) to 84 (78:94) mm Hg in the group of homozygous carriers of Gly389 didn't reach a significance (p > 0,05). The largest decrease in HR by 16,0% (from 78 (71: 92) to 65,5 (60: 72) beats / min) was found in patients homozygous carriers of Arg389, whereas in the group of patients with genotype Arg389Gly reduce was 10,5% (from 76 (70: 84) to 68 (63: 76) beats / min) (p<0,05 for all values). In the group of Gly389Gly β1AR gene polymorphism the decrease in HR (from 72 (69: 84) to 69 (66:88) beats/ minute) didn't reach a significance (p>0,05).

Conclusions: The presents of Arg389Arg polymorphism β1AR was associated with significantly SBP, DBP and HR decrease.

PP.32.05 OVEREXPRESSION OF VASCULAR ENDOTHELIAL GROWTH FACTOR ACCELERATES CARDIAC REMODELING DUE TO HYPOXIA IN PULMONARY ARTERIAL HYPERTENSION (PAH) MODEL RATS

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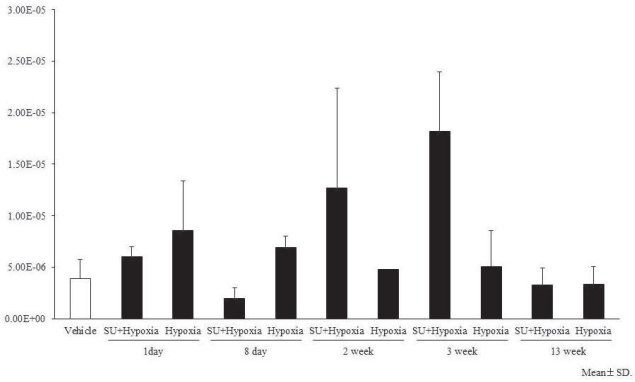
Objective: We have reported that chronic hypoxia combined with vascular endothelial growth factor (VEGF) receptor blocker induces right ventricular (RV) remodeling in rats. The aim of this study was to examine the expression of VEGF chronologically and evaluate the role of VEGF in the development of PAH with arteriopathy.

Design and method: Male Sprague-Dawley rats were exposed to hypoxia (10% O2) for 2 or 3 weeks, after a single subcutaneous injection of VEGF receptor blocker (Sugen 5416, 20 mg/kg, SU+Hypo group) or solution (Hypo group). They were then returned to normoxia for additional 10 weeks. RV function was assessed by echocardiography, and heart was examined by light and electron microscopy, immunohistochemistry, terminal deoxynucleotidyl transferase-mediated dUTP-biotin end labeling (TUNEL), and RT-PCR.

Results: After 2 weeks of hypoxia, tricuspid annular plane systolic excursion (TAPSE; 2.25±0.26 mm) and acceleration time/ejection time (0.22±0.07) were decreased in SU+Hypo compared with those in vehicle (3.03±0.04 mm, 0.32±0.03), although left ventricular systolic function was preserved. Histologically, perivascular fibrosis and hypertrophy of cardiomyocytes and vascular smooth muscle cells were observed in RV myocardium both in Hypo and SU+Hypo. However, degeneration of cardiomyocytes and disorganized capillaries with mononuclear cellular infiltration were accelerated after the reoxygenation in SU+Hypo. Furthermore, expression of 4-hydroxy-2-nonenal proteins and TUNEL-positive myocardial cells were significantly increased. In SU+Hypo, overexpression and delayed peak of VEGF mRNA in RV myocardium were observed 2 and 3 weeks after the injection of VEGF receptor blocker (Figure).



Expression of VEGF mRNA in RV myocardium.

Conclusions: Overexpression of VEGF at the timing of reoxygenation might be relevant to hypertrophied smooth muscle cells and cardiomyocytes in RV myocardium, which might play a role in the development of RV remodeling in PAH.

PP.32.06 MECHANICAL DYSSYNCHRONY IS ASSOCIATED WITH NT-PRO-BNP IN PATIENTS WITH HEART FAILURE WITH REDUCED EJECTION FRACTION

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Objective: The aim of the study was to investigate systolic mechanical dyssynchrony and its interrelation with clinical, echo and laboratory characteristics in adult patients with heart failure with reduced ejection fraction (HFrEF).

Design and method: In 73 patients with HFrEF (71.2% male, 67.3±13.5 years (M±SD), NYHA functional class I, II, III, IV 3, 43, 34 and 20% respectively, ischemic cardiomyopathy 89%, arterial hypertension 71.2%, atrial fibrillation 37%) 12-lead electrocardiogram and complete echocardiographic examination including tissue Doppler imaging were performed. Atrioventricular dyssynchrony was defined as left ventricular filling time <40% of the RR-interval. Interventricular dyssynchrony was measured as the difference in onset of Doppler-flow in the pulmonary and aortic outflow tracts >40 ms. Intraventricular dyssynchrony was expressed as a standard deviation of the time to peak systolic velocity in 12 left ventricular segments >33 ms. Mann-Witney U test was used. P<0.05 was considered significant.

Results: Intraventricular conduction disorders (LBBB and RBBB) were detected in 23 (65.7%) and 1 (2.9%) patients, respectively. Atrioventricular, inter- and intraventricular dyssynchrony was present in 12 (16.4%), 51 (70%), and 66 (90.4%) patients respectively. Interventricular dyssynchrony was associated with lower LV EF (median 30.0 vs 35.0%), greater right ventricle dimension (median 3.1 vs 2.6 cm), and pro-brain N-terminal pro brain natriuretic peptide level (NT-proBNP) (median 7787 vs 810 pg/ml). Intraventricular dyssynchrony was associated with lower LV EF (median 24.0 vs 31.0%),

glomerular filtration rate using MDRD equation (median 51 vs 71 ml/min/1.73 m2), greater LV end systolic volume (median 157 vs 90 ml), LV end diastolic volume (median 183 vs 141 ml) and alkaline phosphate level (median 89 vs 60 U/l).

Conclusions: Systolic inter- and intraventricular dyssynchronies is common in adult patients with HFrEF and is associated with echo characteristics and NT-proBNP.

PP.32.07 APPARENT DISPROPORTION BETWEEN DEMAND AND CAPACITY FOR CARDIAC IMPLANTABLE ELECTRONIC DEVICES IN PATIENTS WITH HEART FAILURE

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Objective: Available evidence has demonstrated survival and clinical benefits associated with implantable cardioverter-defibrillators (ICD) and cardiac resynchronization therapy (CRT) in selected patients with heart failure (HF). In 2012 capacity for implantation of CRT and ICD devices in Russian Federation was 115 and 200 per 1,000,000 HF patients respectively. However the actual number of patients meet the national criteria for ICD and CRT implantation is unknown. The main objective of this study was to estimate the needs for ICD/CRT therapy in HF population.

Design and method: The present study is a cross-sectional epidemiological one center study. In 2013 466 consecutive patients with HF admitted to city clinical hospital for any cause were enrolled as participants in the study. Epidemiological, clinical and laboratory data were collected for each patient. 192 (41.2%) were male, age 70.5±11.7 years (M±SD). We observe the following distribution in NYHA functional class: I, II, III, IV in 31 (6.7%), 190 (40.8%), 186 (39.9%) and 59 (12.6%) patients respectively. The mean duration of HF symptoms was 5.2±3.3 years. Nonischemic cardiomyopathy was reported in 373 (80.0%) patients. Prevalence of severely impaired left ventricular ejection fraction (less than 35%) was 14.2% (n=66). The most common comorbidities were arterial hypertension (n=426; 91.4%) and atrial fibrillation (n=210; 45.0%). Intraventricular conduction disorders (LBBB and RBBB) were revealed in 51 (10.9%) and 23 (4.9%) patients respectively. 375 patients (80.5%) received beta-blockers, 351 (75.3%) ACE inhibitors, 55 (11.8%) angiotensin receptor blockers and 206 (44.2%) loop diuretics.

Results: According to national and European guidelines 6.4% (n=30) and 13.9% (n=65) of participating patients were eligible for CRT and ICD implantation respectively. Thus current capacity for implantation of CRT and ICD in Russian Federation corresponds to less than 1% coverage of the eligible population (estimated absolute unmet needs for CRT and ICD devices of 504,689 and 1,096,520 individuals respectively).

Conclusions: Despite proved benefits of CRT and ICD in selected patients with HF unmet population needs in Russian Federation remain very high. The magnitude of unmet needs requires broader strategies to plan cardiovascular implantable electronic devices supply programs.

PP.32.08 ARTERIAL HYPERTENSION AS A PRIMARY CAUSE AND CO-MORBIDITY IN HEART FAILURE PATIENTS. DID WE LOSE THE BATTLE?

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Objective: Arterial hypertension (AH) is a common cause of heart failure (HF), but it is also very frequent co-morbidity in HF patients.The aim of our study was to investigate the prevalence of AH in patients admitted to hospital due to decompensation of chronic HF and its influence on one year prognosis.

Design and method: In our prospective study we included 201 consecutive patients, mean age 71.5 ± 10.3 years of whom 60.7 % were male admitted to ICU.

Results: The average duration of HF was 1.69±1.1 years. The majority of patients were in New York Heart Association (NYHA) functional class III (53.7%), 27.4% were in NYHA class II and 18.9% were in NYHA IV class. Arterial hypertension was one of the most frequent primary causes of HF (23.9% of patients) after the coronary artery disease (29.9%) and dilated cardiomyopathy (27.9%). In 33.3% of patients, HF with preserved left ventricular ejection fraction was diagnosed, and the AH was the dominant etiological factor.
Arterial hypertension was the most frequent co-morbidity in our patients (80.6%), followed by diabetes (54.7%), atrial fibrillation (47.3%) renal insufficiency (43.3%), acute infections (32.8%) and others. 32.8% of patients had 3 associated co-morbidities, 31.8% patients had 2 and 16.4% of patients had 4 conjoined co-morbidities. 42.8% of patients died during 1-year of follow up period and 80% of them had AH as a co-morbidity, 10% of those patients died during the initial hospitalization. In logistic regression analysis AH did not have significance on 1-year mortality rate as a direct prognostic factor.

Conclusions: In our study we included patients admitted to ICU in a consecutive order. In this "real life" study we found AH being present in almost every patient either as a principal cause of HF or as co-morbidity. Until future research on underlying mechanisms of primary hypertension make treatment less empiric and more effective than current practice the primary goal in health care system should be aimed to prevention from the earliest childhood and raising the awareness in all healthcare workers.

PP.32.09 THE TRIGGERS OF THE ACUTE DECOMPENSATED CHRONIC HEART FAILURE DEVELOPMENT

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Objective: The aim of the research was determination of the causes and outcome of the acute decompensated chronic heart failure (ADCHF).

Design and method: For this purpose an observational study of "case-control" type was carried out in 202 patients. 55 patients with the manifestation of acute decompensation of the CHF were included into the Group "Case" and 147 patients with the steady chronic heart failure were included into the Group "Control".

Results: From the 55 patients (33 females/22 males) at the age of 67±12 with the acute decompensation of CHF 58% suffered myocardial infarction, 69% had arterial hypertension , 49% had atrial fibrillation, while in the "Control" Group consisting of 147 patients (67 females/80 males) at the age of 69±10.1 myocardial infarction comes to 54%, arterial hypertension-52%, atrial fibrillation – 49%.
In the "Case" Group the acute coronary syndrome was a precipitating factor in 12 patients (21.8%), the cardiac rhythm disturbances was a triggering factor in 35 patients (30.6%), the poor arterial tension control – in 21 patients (38,2%), compliance violence in 24 patients (73.6%), violation of the water-salt condition in 3 patients (5.4%) and in 10 cases the trigger determination turned out to be impossible. 76% of the patients had comorbid pathology.
Only 34,8% of the patients received CHF therapy, including the combination of minimum two medicines from those basic ones (ACE inhibitors, beta-blockers, spironolactone, diuretics).
The therapy corresponded to the recommendations of treating acute heart failure in 61% of the cases.

Conclusions: The main triggers of the acute decompensated CHF onset are compliance violence to the administered treatment, acute coronary syndrome, hypertensive crisis, atrial fibrillation seizures, hemoglobin lowering, and creatinine level increase.

PP.32.10 PROGNOSTIC ROLE OF FLOW-MEDIATED VASODILATORY RESPONSE DEPENDING ON ETIOLOGY OF CHRONIC HEART FAILURE

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Objective: To establish the dependence of endothelium-mediated vasodilatory response on severity, etiology and 12-months survival prognosis of CHF.

Design and method: We examined 146 hemodynamically stable CHF patients (pts), NYHA II-IV, LVEF<40%, chronically treated by diuretic, ACE inhibitor and ß-blocker. Hypertensive heart disease (HHD) was established in 99 pts, and dilated cardiomyopathy (DCMP)–in 47 pts. Diameter of a.brachialis (D) was detected ultrasonographically before (D1) and after (D2) standard forearm cuff test. Flow-mediated vasodilation (FMV) was calculated by formula: (D2-D1)/D1×100%. Flow-independent vasodilation (FIV) was calculated similarly, based on measurements of D before and 5 min after sublingual nitroglycerine (0,5 mg) administration. Kaplan-Meier 12-months survival analysis was performed for FMV based on «below-median vs above-median» approach.

Results: In CHF pts FMV was significantly impaired in comparison to age-matched controls (6,8±0,5% vs 11,04±1,3%, p<0,01). More pronounced impair-

ment of FMD in III-IV NYHA class pts than in II NYHA class was observed (6,3±0,8% vs 7,1±1,1%, p=0,03). In DCMP FMV was significantly worse than in HHD (5,5±0,8% vs 7,4±1,3%, p<0,001) despite comparable LVEF (p=0,47) and NYHA class (p=0,62) in both groups, and younger age (p<0,01) in DCMP group. FIV didn't demonstrate any significant differences in NYHA III-IV and NYHA II groups (19,5±3,8% vs 20,3±4,1%, p=0,6), HHD and DCMP (20,5±3,9% vs 19,2±3,1%, p=0,4).
12-months survival was significantly better in group with better (above-median) FMV (93% of pts alive vs 85% of pts alive in below-median group, p=0,047), although LVEF in both groups were comparable (33,5±8,1% vs 32,1±7,3%, p=0,32).

Conclusions: In CHF FMV is pronounsly impaired, particularly in NYHA III-IV and DCMP pts. The better FMV responders demonstrated the better 12-months survival than worse responders despite comparable LVEF in both groups.

PP.32.11 WAON-THERAPY (WARMING THERAPY) IMPROVED CARDIO-ANKLE VASCULAR INDEX (CAVI) IN HEART FAILURE PATIENTS

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Objective: Waon-Therapy was invented for the therapy of heart failure by Dr. Tei. The purpose of this study was to clarify the mechanism by which Waon-therapy improved heart failure by studing its effect on the arterial stiffness monitoring with cardio-ankle vascular index (CAVI), which is a new parameter indicating the stiffness of the arterial tree from the origin of arorta to the ankle. The conspicuous feature ofCAVI is its independency from the blood presure at detecting time.

Design and method: Study 1. Subjects were 7 patients with chronic heart failure. They were divided randomly into Waon-therapy group and conservative therapy group. Waon therapy was performed as follows; worming up at 60° for 15 min in a chamber, and then, laying down in supine position with covering warm blanket for 30 min. They took this therapy once a day for 14 days.
Study 2. A person, 64 years old man with diabetes mellitus, who is taking hemodialysis therapy. He was suffering from systemic arteriosclerosis acompaning penes necrosis, and heart failure. He took Waon therapy for 3 months. CAVI was measured using Vasela1500 (Fukuda Denshi. Co.LTD).

Results: Study 1. Among 7 heart failure patients, Waon therapy group 4 patients showed improved BNP from 1220- 780 pg/ml, whereas conservative group 3 patients did not show improvement of BNP from 720 to 920 pg/ml. CAVI improved in Waon group from 10.5 to 9.3, but in conservative group, CAVI did not change.
Study 2. 65 year old man taking maintenance hemodialysis were suffering from necrosis of penis because of arteriosclerosis. He took Waon therapy for 3 months. At every week, BNP decreased from 4200 to 3400, 2600, 1560 pg/ml after 3 months. CAVI also decreased from 13.4 to 13.2 12.3, 11.2, 10.8, 11.2. Penis necrosis was improved completely.

Conclusions: Waon therapy improved heart failure, associating with improvement of CAVI. These results suggested that Improved CAVI implying decreased arterial stiffness might decrease after-load of systemic circulation, and then, heart failure might be improved.

PP.32.12 PROJECTIVE STUDY OF EUTHYROID SICK SYNDROME PREVALENCE IN PATIENTS WITH LEFT VENTRICULAR HEART FAILURE IN ACUTE MYOCARDIAL INFARCTION AND THE IMPACT OF PRIOR BETA-BLOCKERS ADMINISTRATION

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Objective: Recent data indicate that acute left ventricular heart failure may alter thyroid metabolism resulting in triiodthyronine (T3) concentration decrease. The purpose of projective study was to assess the prevalence of euthyroid sick syndrome (low T3syndrome) in patients with acute myocardial infarction (STEMI and non-STEMI) and to establish the impact of prior beta-blockers' administration.

Design and method: Plasma T3, reverse T3 (rT3), free T3 (FT3), thyroxine (T4), free T4 (FT4), thyroid-stimulating hormone (TSH), thyroxine-binding globulin (TBG) levels were determined by means of radioimmune assay in 47 patients (M/F:32/15, aged 61.4±7,4) with acute myocardial infarction and 18 healthy subjects (M/F:14/4, aged 59,4±6,9) for a period of 3 days from the onset of the acute coronary syndrome, 1, 6 months later. Patients were divided according to prior beta-blocker therapy.

Results: There was a reliable T3 decrease and rT3 increase in all patients during the first 3 days following admission (p<0.05). FT3 and FT4 remained unchanged during 3 day period. There was a strong correlation between the degree of T3 decrease as well as rT3 increase with the severity of the clinical course of myocardial infarction. Patients with acute left ventricular failure showed significantly greater decrease of T3 (p<0.01). No reliable differences were registered according to the prior beta-blocker therapy.

Conclusions: The reliable T3 decrease, increase of rT3 levels suggest that the euthyroid sick syndrome (low T3) occurs not only in STEMI but also in non-STEMI myocardial infarction. In addition, these hormonal changes are not affected by beta-blocker therapy. The degree of T3 decrease is proportional to the severity of cardiac damage and may have valuable prognostic value.

PP.32.13 IMPACT OF DECLINE IN KIDNEY FUNCTION ON THE DEVELOPMENT OF HEART FAILURE IN PATIENTS WITH CARDIOVASCULAR DISEASE

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Objective: Chronic kidney disease (CKD) is associated with a substantially increased risk of mortality. In this study, we evaluated impact of decline in kidney function assessed with cystatin C on the development of heart failure (HF) in patients with cardiovascular disease.

Design and method: 97 patients with cardiovascular disease were examined (56males, 68years). Cystatin C was measured in 2010 and 2012, and delta cystatin C was calculated. Factors associated with delta cystatin C were evaluated. Influence of delta cystatin C on future occurrence of HF was also evaluated.

Results: From 2010 to 2012, mean cystatin C increased from 0.92±0.30mg/L to 1.00±0.37mg/L (p<0.0001). In univariable analysis, age (r=0.23, p<0.05), pulse wave velocity (PWV) (r=0.29, p<0.01) and urinary albumin (r=0.25, p<0.05) were associated with delta cystatin C. During follow-up period of 350 days, 11 patients developed HF. Patients with HF had higher age (p<0.05) and higher frequency of diuretics use (p<0.01) compared with patients without HF. Delta cystatin C was higher in patients with HF compared with patients without HF (0.23±0.34 vs 0.06±0.14ml/L, p<0.01). Delta cystatin C was significantly associated with the occurrence of future HF after adjustment for age, gender, LVEF, prevalence of hypertension and diabetes (p<0.05).

Conclusions: PWV and diuretics use was associated with progression of chronic kidney disease, which may result in development of future heart failure.

PP.32.14 INFLUENCE OF PROGRESSION OF ARTERIAL STIFFENING ON NT-PROBNP LEVEL IN PATIENTS WITH CARDIOVASCULAR DISEASE

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Objective: Arterial stiffness is well known as a significant predictor of cardiovascular event. Some previous reports demonstrated the significant association between arterial stiffness and BNP level which is a marker of heart failure (HF); however, whether the progression of arterial stiffness has influence on change in NT-proBNP level has not been clarified.

Design and method: 105 patients with cardiovascular disease were examined (60males, 70years). Pulse wave velocity (PWV) between brachial and ankle, and NT-proBNP were measured in 2011 and 2013, and delta PWV and delta NT-proBNP were calculated. Factors associated with delta PWV were evaluated. The influence of delta PWV on delta NT-proBNP as well as NT-proBNP in 2013 was also evaluated.

Results: From 2011 to 2013, mean PWV increased from 18.2±4.5 to 19.3±5.5m/sec (p=0.012). In univariable analysis, age, prevalence of hypertension, diuretics use, serum creatinine and NT-proBNP level at baseline was associated with delta PWV. Delta PWV was positively associated with delta NT-proBNP (r=0.347, p=0.0003) and NT proBNP measured in 2013 (r=0.217, p=0.0288). The association between delta PWV and delta NT-proBNP was still significant after adjustment for confounding factors including age, gender, incidence of hypertension, diabetes mellitus and kidney function (p=0.002).

Conclusions: Impairment of kidney function is associated with progression of arterial stiffening, which may result in increase in cardiac load assessed with NT-proBNP in patients with cardiovascular disease.

PP.32.15 A SINE QUA NON MUST. EVERY PATIENT WITH LEFT HEART FAILURE MUST BE MONITORED FOR SEVERE MASSRY'S PHOSPHATE DEPLETION SYNDROME

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Objective: In this study we investigated serum phosphorus levels in patients with acute left heart failure.

Design and method: A total of 215 participants, 115 patients with acute left heart failure and 100 controls, were enrolled in the study. Patients applied to emergency room with the complaints of heart failure were assessed by echocardiography. Ejection Fraction (EF) levels lower than 50% were accepted as heart failure. Paients with renal disorders, hyperparathyroidism, chronic hearth failure, alcoholism, intake of medications that alter phosphorus level were excluded. Mean phosphorus levels of each group were measured and compared each other. SPSS 12.0 package program (SPSS Inc., Chicago, Illinois) was used for statistical analysis. Chi square test was used to compare categorical measures between the groups. Mann Whitney U or T test was used for comparison of numerical measurements between the two groups. Level of statistical significance was considered as 0.05 in all tests.

Results: There were 148 (69%) women and 67 (31%) men in present study. The mean age was 52.6±12.1 years. Demographic characteristics of participants were not significantly different between the groups. Mean EF levels of groups were 40.8±6.3, 60.0±9.7 respectively. The difference was statistically significant (P<0.001). Mean phosphorus levels were 3.0±1.1, 4.2±0.7 mg/dl respectively. There was statistically significant difference (P=0.041) (Table 1).

Table 1: phosphorus levels in study and control group.

	Study group (HF +) N=115	Control group (HF -) N=100	P
Phosphorus (2.5-4.6 mg/dl)	3.0±1.1	4.2±0.7	0.041
EF (>50%)	40.8±6.3	60.0±9.7	<0.001

Conclusions: Phosphorus is a major intracelluler constituent. The deficiency of phosphorus can cause a variety of signs and symptoms. Myocardial creatine phosphate, ATP, and ADP levels reduce in case of phosphate deficiency. In addition to these, mitochondrial and myofibrillar creatine phosphokinase activities also reduces. Alterations occur in mitochondrial oxygen consumption, acid-extractable phospholipid precursors, and mitochondrial oxidation of long chain fatty acids due to phosphate depletion. All these effect heart muscles and can cause heart failure. Consequently phosphorus levels should be controlled in patients with acute left heart failure. Phosporus supplementation may be a supportive treatment.

PP.32.16 TORASEMIDE DUAL BLOCKADE OF ALDOSTERONE AND SODIUM CHANNEL IN RENAL FAILURE INDUCED HEART FAILURE

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Objective: Torasemide is a long-acting loop diuretic that combines the effects of both furosemide and spironolactone. Previous study showed that torasemide, may have anti- aldosterone effect and also associated with low mortality in patients with chronic heart failure (CHF) by attenuate left ventricular hypertrophy (LVH) and decreasing the extracellular fluid volume by reduction of salt and water retention also can modulate cardiac fibrosis formation in chronic heart disease.

Design and method: Three-week-old uninephrectomized (UNx) Sprague-Dawley (SD) rats were divided into the following groups: 1) Normal salt diet(0.5% NaCl) as a control; 2) HS (8.0% NaCl) diet alone; 3) HS diet plus treatment with the Torasemide (3mg/(kg day), T3); 4) HS diet plus treatment with the Torasemide (10mg/(kg day), T10); 5) HS diet plus treatment with the Furosemide (30mg/(kg day), F30); 6) HS diet plus treatment with the Furosemide (100mg/(kg day), F100); Rats were treated for 4 weeks, body weight, blood pressure (BP), cardiac and renal function is monitored.

Results: Treatment by Torasemide low and high doses and high doses Furosemide decrease body weight (232mg, 211mg, 227mg) and blood pressure (SBP: 138mmHg, 121mmHg, 127mmHg) dose dependently compare with HS group (BW: 260mg SBP: 158 mmHg) but not in Furosemide low doses (SBP: 165mmHg BD: 245mg), Torasemide low and high doses could reverse kidney function by lowing urine protein level (29.2±3.5mg/day, 11.8±2.1mg/day to 135±20mg/day) and blood creatinine (0.248±0.022mg/dL, 0.18±0.012mg/dL to 0.28±0.044mg/dL) level compare with the HS group but mild reverse urinary protein level treatment by Furosemide low and high doses(64±15mg/day, 68±22mg/day). Also kidney histopathological investigated that glomerular and interstitial injury was significantly reduced treatment with Torasemide low and high doses and high doses Furosemide but not in low doses Furosemide. Kidney mRNA expression of collagen3a1 was ameliorated by treatment with low and high doses Torasemide than Furosemide group, Cardiac catheter showed that treatment by low and high doses Torasemide can attenuate Isovolumic relaxation constant (Tau) level compare with HS group.

Conclusions: For the first time we showed that Torasemide have strong protect effect on kidney and cardiac function than furosemide in salt-sensitive hypertension and CKD model.

PP.32.17 THEORIC POSSIBILITIES OF IVABRADINE IN HOSPITALIZED HEART FAILURE

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Objective: Ivabradine is recommended for uncontrolled ischemic heart disease since 2005 in Spain. Indication for heart failure (HF) was approved in 2012. Our objective was to analyze theoric possibilities of ivabradine in patients hospitalized for HF.

Baseline characteristics	n 269
Edad (años) media (DE)	74 (8)
Sexo (varones %)	55,3
DLP %	40'9
DM %	47,6
HTA %	73,3
Tabaquismo %	17
NYHA %	
2	33,1
3	38,3
4	28,8
Etiologia %	
Isquémica	46
Arritmogénica	49,6
Valvular	27,7
Hipertensiva	40,1
Tratamiento %	
Estatinas	41
Clopidogrel o AAS	44,3
ARA2 o IECA	61,5
Antialdosteronico	13,5
Betabloqueante	31,8
Diuretico	63,5
FE %	49,6

Design and method: Retrospective transversal study of > 18 and < 85 years old patients admitted to our hospital from 12-2007 to 6-2011 with HF. 269 medical records were analyzed, and theoric indication of ivabradin for HF was evaluated attending to those patients with sinus rhythm, heart frequency higher 70 beats/min and EF lower than 35% (patient requirements), and optimized treatment with ACE or ARB inhibitors, betablokers (at higher tolerated dosis) and antialdosteronic drug (treatment requirements). Data where analyzed with SPSS 20.0 S for MAC.

Results: Baseline characteristics are shown in table 1. All patients with ivabradine (7) had ischemic heart disease. Patient requirements were present and absent in 24 patients (9.8%) vs 220 (90.8 %) patients respectively (p 0.023). Adding treatment requirements only 1 patient (0.4%) should be treated and 266 patients did not. (adding ACE or ARB 14 patients (5,5%) and including betablocker just 8 (3%).
Among those with patient requirements for HF, ivabradin treatment was
Cardiovascular and any cause mortality and hospitalizations among those with patients requirements was 16.7 %, 16.7%, 33% and 54.2% (4, 4, 8 and 11 cases) respectively.
Ivabradin was present in 3 and absent in 4 of these patients. There were no differences in clinical outcomes among those with and without ivabradin.

Conclusions: All patients treated with ivabradin had ischemic heart disease in our serie.
Theoric indication and so, possibilities of ivabradin in hospitalized HF is lower than 10% even if medical treatment were optimized.

PP.32.18 SLOW BREATHING TRAINING IMPROVES PULMONARY PRESSURE AND FUNCTIONAL CAPACITY IN PATIENTS WITH CHRONIC HEART FAILURE AND PULMONARY HYPERTENSION

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Objective: Regular slow breathing may improve autonomic cardiac regulation and reduce chemoreflex sensitivity in chronic heart failure (CHF).
In 2008, we demonstrated that slow breathing training improved NYHA class, exercise capacity, pulmonary function, ventricular ejection fraction and pulmonary pressure in CHF patients.
We explored the possibility to use slow breathing training in real life.
Moreover, we investigated whether a period of respiratory training at home could affect exercise capability and pulmonary pressure in unselected CHF patients.

Design and method: We enrolled 36 CHF patients (pts) (71±7 years, left ventricular ejection fraction EF 31±6%, NYHA class 2.7±0.5) to an unsupervised training period of 10-12 weeks.
They learned to use the equipment for slowing their breathing rate, but were not strictly followed up as in the previous study.
In all pts, before enrollment and after the training period, we collected BNP levels and performed: 6 minutes walking test (6MWT) or cardiopulmonary test, echocardiography, Minnesota quality of life (MQoL) questionnaire.

Results: Three pts dropped from the study, 12 never or very seldom performed the training (non-adherent), while 22 patients performed enough sessions (> 75%) to be judged adherent and trained, as demonstrated by the slowing in their respiratory rate (- 4 ± 1 breaths/min, $p < 0.05$).
In the 22 trained pts, slow breathing training improved : NYHA class (from 2.7 ± 0.5 to 1.55± 0.5, $p< 0.01$), EF (from 31±6% to 34±7%, $p<0.04$), estimated pulmonary pressure (from 40±10 mmHg to 34± 7 mmHg, $p<0.001$), 6MWT distance (from 390 ±61 to 415 ± 82 mt, $p<0.02$), VEVCO2 at cardiopulmonary test (from 39.9 ± 7.8 to 35.8 ± 6.7, $p<0.01$).
On the other hand, respiratory training did not significantly change BNP levels, peak VO2 and the MQoL score. In non-adherent pts no changes were observed in any of the variables.

Conclusions: In the real world, slow breathing training is feasible in about 30% of patients, since good adherence to regular exercise is requested.
Changes in relevant variables are similar to those observed in the pilot study, therefore this type of training should be offered to selected and well motivated patients.

PP.32.19 INFLUENCE OF TELMISARTAN AND TORASEMID ON MYOCARDIUM FUNCTIONAL STATE IN HYPERTENSIVES WITH DIASTOLIC HEART FAILURE

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Objective: Investigate the influence of treatment with including telmisartan and torasemid on myocardium functional state in hypertensives with diastolic heart failure (HF) accordingly to the plasma endogenous insulin (EI) levels.

Design and method: The study was performed on 44 non-diabetic hypertensives (19 male, 25 female) with diastolic HF in NYHA class II-III, aged 60±11 years. Group 1 included 20 patients with the normal EI levels; group 2 included 11 patients with 2hr postloading hyperinsulinemia; group 3 included 13 patients with basal and postloading hyperinsulinemia. Methods included echocardiography (echo), oral glucose-tolerant test with determination of plasma EI levels at baseline and 4 weeks after treatment of telmisartan 40-80 mg/d and torasemid 5-10 mg/d. The control group consists 10 healthy people.

Results: Basal echo parameters intra-ventricular septum (IVST) and left ventricle (LV) posterior wall thickness (PWT) were increased by 30% (group 1); 50% (group 2) and 47% (group 3) vs. control 0.89±0.22cm and 0.97±0.21cm ($p<0.05$). LV mass were increased by 70% (group 1) and more than 2 times in groups 2 and 3 vs. control 170±22g ($p<0.05$). LV ejection fraction (EF) was in the control range 62.8±2% ($p<0.05$). Wave E had tendency to decrease in all groups vs. control 0.78±0.2 m/s. Wave A was increased by 19% (group 1); 40% (group 2) and 41% (group 3) vs. control (0.59 ±0.15) m/s ($p<0.05$). Waves E/A ratio was decreased by 37% (group 1); 48% (group 2); 49% (group 3) vs. control 1.69±0.08 U ($p<0.05$). After complex treatment IVST, PWT and LV mass were decreased by 8%; 7% and 10% (group 1) ($p<0.1$); 6%; 5% and 8% (group 2); 6%; 4% and 6% (group 3) ($p<0.1$) vs. basal levels. In all groups LV EF have tendency to increasing ($p<0.1$). Wave E have tendency to increasing ($p<0.1$). Wave A have tendency to decreasing ($p<0.1$). E/A ratio was increased by 10% ($p<0.05$).

Conclusions: Hypertensives with diastolic HF in NYHA class II-III tend to diastolic dysfunction type I, increasing of myocardial stiffness. Treatment with telmisartan and torasemid improves diastolic function and LV relaxation and tend to LV hypertrophy regress in hypertensives with diastolic HF.

PP.32.20 EFFECT OF HYPERTENSION ON THE RELATIONSHIP BETWEEN EJECTION FRACTION AND LEFT VENTRICULAR MASS IN HEART FAILURE: DO AGE AND GENDER MATTER?

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Objective: Heart failure in patients with hypertension has been usually been associated with preserved ejection fraction (EF). The role of hypertension in the types of heart failure as regards ejection fraction and left ventricular (LV) mass in men and women remains unclear. Hence we sought to explore the relationship between ejection fraction and left ventricular mass in heart failure patients with and without hypertension stratified by age and gender.

Design and method: Cross sectional study of echo-cardiogram studies done in 2009 of patients with heart failure seen by primary or specialist providers at a large medical group. Patients were stratified by age, gender and presence or absence of a history of hypertension.

Results: Of the 946 heart failure patients, 519 had normal blood pressure (NBP) and 427 had hypertension (HTN). Table 1 shows the distribution of these patients into male and female along 4 age categories. Table 2 shows the mean ejection fraction and the mean LV mass for each category. Female patients with heart failure have a higher EF than male patients. Females with hypertension have the highest EF of the four groups studied (Fig 1). Male heart failure patients with hypertension have higher LV mass with age than males with NBP.

Table 1: Number of patients in each age category

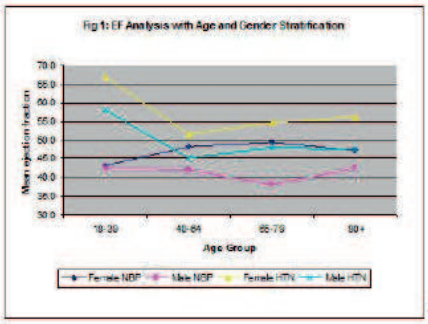
Group	18-39	40-64	65-79	80+	Total
Female NBP	1	30	78	90	199
Female HTN	11	65	68	29	173
Male NBP	3	46	92	87	228
Male HTN	11	85	165	85	346

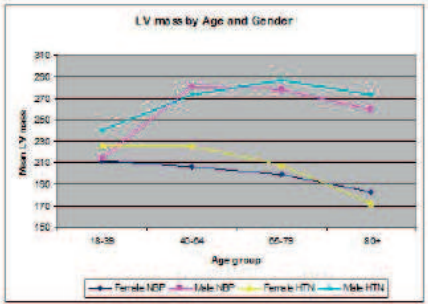
Table 2: Mean Ejection fraction (%) by Age

	All	18-39	40-64	65-79	80+
Female NBP	48.2	43.1	48.2	49.5	47.2
Female HTN	55.0	67.0	51.7	54.8	56.1
Male NBP	40.3	42.6	41.9	38.1	42.5
Male HTN	47.4	58.0	45.2	48.1	47.5

Mean LV Mass by Age

	All	18-39	40-64	65-79	80+
Female NBP	200	212	207	199	183
Female HTN	195	226	225	208	172
Male NBP	273	214	281	278	259
Male HTN	269	240	273	286	273





Conclusions: Our findings suggest that women with hypertension tend to have heart failure with preserved ejection fraction despite LV mass reduction with age whereas men with normal blood pressure tend to have heart failure with reduced ejection fraction even with preservation of the LV mass.

PP.32.21 DOMINANTLY INCREASED PLASMA PROBNP, A PRECURSOR OF B-TYPE NATRIURETIC PEPTIDE, IN PATIENTS WITH RENAL FAILURE

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Objective: Recent studies have demonstrated that precursor proBNP[1-108] dominantly circulates in heart failure compared with BNP[1-32], and that current BNP immunoassay also measures proBNP, as the anti-BNP antibody cross-reacts with proBNP. We recently developed the immunoassay system for total BNP (BNP+proBNP) and proBNP, which enable to assess proBNP/total BNP ratio. In the present study, we investigated the total BNP, proBNP, BNP, and proBNP/total BNP ratio in normal subject and in patients with renal failure. We also assessed the metabolism of BNP and proBNP in human circulation.

Design and method: We measured plasma total BNP (BNP+proBNP) and proBNP by our recently developed immunoassay, and calculated BNP(total BNP - proBNP) and proBNP/total BNP ratio in normal subject (n=65), patients with renal failure (n=67), patients with renal failure undergoing hemodialysis (n=21). We also measured plasma arterial and venous total BNP, proBNP, and proBNP/total BNP ratio in 17 patients with heart failure obtained during cardiac catheterization.

Results: The mean plasma total BNP and proBNP levels from normal subjects were 2.1±1.4 pM and 1.4±0.8 pM, respectively. The mean plasma total BNP and proBNP were 31.5±36.8 and 20.8±23.2 in 67 patients with chronic renal failure and 108.2±100.6 pM and 84.5±87.0 pM in 21 hemodialysis patients, respectively, both of which were significantly higher than those of normal subjects. Interestingly, proBNP/total BNP ratio in patients with renal failure with and without hemodialysis were significantly higher than those in normal subjects (0.77±0.10, 0.73±0.15 vs 0.67±0.14, each P<0.05). The plasma total BNP (23.0±19.3 vs 27.1±20.7, P<0.05) and BNP (6.5±6.4 vs10.1±7.4, P<0.05) levels were significantly lower in vein than in artery, whereas there were no differences in proBNP levels (16.5±14.3 vs 16.9±14.2, NS) between vein and artery. As a result, proBNP/total BNP ratio was higher in vein than that in artery (0.69±0.13 vs 0.58±0.11, P<0.05).

Conclusions: These results suggest that major molecular form of increased BNP immunoreactivity in renal failure is proBNP, and that increase of proBNP is higher than BNP. ProBNP is not metabolized in peripheral circulation, being consistent with the hypothesis that biological activity proBNP is weak.

PP.32.22 DIASTOLIC DYSFUNCTION IN PATIENTS WITH ARTERIAL HYPERTENSION AND CHRONIC KIDNEY DISEASE

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Objective: In patients with arterial hypertension and chronic kidney disease (CKD), the prevalence of diastolic heart failure (HF-PEF) is probably very high. However, in these patients the diagnosis is difficult, especially because the signs and symptoms suggestive of HF-PEF are very common in CKD; in these cases the detection of left ventricular structural and functional alterations (as reported in the 2012 ESC guidelines on heart failure), assumes a decisive role for the diagnosis of HF-PEF. The aim of this study was to evaluate the prevalence of patients with diastolic dysfunction according to ESC guidelines 2012 in a population of hypertensive patients with CKD.

Design and method: We studied 466 hypertensive patients with mean age of 62.3 ± 12.6 years (M / F = 262/204) suffering from chronic kidney disease (stages 3-4-5 KDIGO), with a mean value of GFR equal to 26.8 ± 15.1 mL / min/1.73m2. The criteria for exclusion from the study were: EF <50%, other cardiovascular diseases that could cause heart failure. Were considered with diastolic dysfunction, all patients with a value of Em (evaluated with tissue Doppler imaging at lateral mitral annulus) less than 10 cm / sec.

Results: We found a value of Em <10 cm / sec in 331/466 patients (71%). In order to determine the role of CKD to explain the very high prevalence of diastolic dysfunction, we selected 160 hypertensive patients with overlapping features to the previous group with regard to age, sex, BMI, etc.. In this population the prevalence of diastolic dysfunction was 43.7%.

Conclusions: The results show a very high prevalence of diastolic dysfunction in the studied population; it is possible to assume that a large proportion of these patients had HF-PEF or is at high risk for its development. The finding of a lower prevalence of diastolic dysfunction in a hypertensive population supports the hypothesis of a decisive role of CKD in determining diastolic dysfunction and HF-PEF.

PP.32.23 THE IMPACT OF THYROID HORMONE REPLACEMENT THERAPY ON LEFT VENTRICULAR DIASTOLIC FUNCTION IN PATIENTS WITH SUBCLINICAL HYPOTHYROIDISM

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Objective: Subclinical hypothyroidism is associated with a moderately elevated risk of heart failure events and increased risk of cardiovascular mortality among older adults with a thyrotropin level of 7-10 mU/l. Objective was to assess he impact of thyroid hormone replacement therapy with thyroxin on left ventricular diastolic function in patients with associated subclinical hypothyroidism.

Design and method: The study involved 33 patients (f/m: 24/9, mean age 51,21±4,32 years) with subclinical hypothyroidism diagnosed by elevated thyrotropin levels (>4,2 mU/l) and normal levels of free triiodothyronine and free thyroxin, 25 healthy controls (f/m: 17/8, mean age 49,33±3,67 years). All patients and the control group underwent standard echocardiography and doppler imaging. Among the standard indices E/A ratio (early-E and late-A mitral peak velocities) and the intraventricular septum thickness determination was accentuated. All patients with subclinical hypothyroidism received thyroxin replacement therapy (mean doses 19,35±3,67mkg) during 6 months to establish euthyroid state.

Results: At the baseline the patients with subclinical hypothyroidism showed significantly lower E (0,79±0,22 against 0,93±0,19, p<0,001), E/A ratio (1,19±0,29 against 1,31±0,25, p<0,003) and higher intraventricular septum thickness (0,99±0,14 against 0,89±0,18, p<0,001). After 6 months of thyroxin substitution patients with subclinical hypothyroidism had significantly higher E/A ratio (1,28±0,21 against

1,19±0,29, p<0,001) and reduced intraventricular septum thickness (0,92±0,16 against 0,99±0,14, p<0,001) indices.

Conclusions: Thyroxin replacement therapy in patients with subclinical hypothyroidism may improve the left-ventricular diastolic function.

PP.32.24 DIAGNOSIS OF MYOCARDIAL DYSFUNCTION IN CHRONIC HEART FAILURE AND CHRONIC KIDNEY DISEASE PATIENTS

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Objective: The aim of the study was to determine the role of cystatin C in diagnosis of myocardial dysfunction in patients with chronic heart failure (CHF) and CHF accompanied by chronic kidney disease (CKD).

Design and method: The study involved 103 patients with CHF, caused by ischemic heart disease and arterial hypertension. The first group included 58 patients with CHF accompanied by CKD, the second group- 45 patients with CHF without CKD. The control group comprised 20 healthy persons. The levels of cystatin C were accessed by ELISA, the levels of creatinine - by Jaffe - method; the glomerular filtration rate (GFR) – by MDRD formula, the cardiohemodynamics parameters - by echocardiography.

Results: In patients with CHF accompanied by CKD and CHF without CKD the levels of creatinine were increased by 66,3% (p<0,01) and 22,9% (p<0,05), the levels of cystatin C - by 83,3% (p<0,01) and 48,3% (p<0,05), the GFR were decreased by 48,5% (p<0,01) and 27,4% (p<0,05) in comparing with the control group.
In patients with CHF with CKD (35 patients) and CHF without CKD (31 patients) with preserved ejection fraction (EF>45%) the levels of creatinine were increased by 32,5% and 24,1% (p>0,04, p>0,05), the levels of cystatin C - by 66,6% and 32,5% (p<0,01, p<0,05), the levels of GFR were decreased by 44,4% and 26,6% (p<0,01, p<0,05).
In patients with CHF accompanied by CKD (23 patients) and CHF without CKD (14 patients) with reduced ejection fraction (EF<45%) the levels of creatinine increased by 81,9% and 20,4% (p<0,001, p<0,01), the levels of cystatin C - by 85,3% and 63,7% (p<0,001, p<0,01), the levels of GFR decreased by 53,5% and 29,6% (p<0,001, p<0,05).

Conclusions: Defined more pronounced elevation of cystatin C levels in patients with systolic myocardial dysfunction in comparing with preserved systolic function, what allows to recommend its definition as a marker of dysfunction of myocardium in patients with CHF and CHF accompanied by CKD.

PP.32.25 IMPACT OF RENIN-ANGIOTENSIN SYSTEM (RAS) BLOCKADE IN RAS COMPONENTS IN PATIENTS WITH CHRONIC HEART FAILURE

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Objective: Chronic heart failure (CHF) is a marked economic burden due to high morbidity and mortality. Chronic RAS activation contributes to long-term deleterious effects, being RAS blockers a cornerstone of CHF treatment. Actual RAS includes a wide variety of peptides and enzymes that are not so well characterized in CHF. We aimed at characterizing the RAS components (1) in patients with mild and severe CHF, and (2) in patients treated with angiotensin-converting enzyme (ACE) inhibitors or angiotensin II receptor blockers (ARBs).

Design and method: The project was approved by the Health Ethics Commission of the Hospital S. João (HSJ). Sixty one patients with CHF were selected from the Heart Failure Clinic of HSJ giving their informed consent. On the day of the visit, age, gender, functional status (NYHA classes I-IV), blood pressure and chronic medication were taken and blood and urine samples collected. Angiotensinogen (AGT) was determined using a commercial ELISA kit, angiotensin (Ang) I, Ang II and Ang (1-7) by RP-HPLC with UV detection and other parameters using an automated biochemical analyzer. Statistical analysis was done by independent samples t-test or Mann-Whitney test.

Results: Severe CHF patients were older, weight less, had increased BNP and CysC levels, and decreased GFRe than mild CHF patients. There was no difference in systolic or diastolic blood pressure, AGT, Ang II, Ang (1-7) and renin levels between groups, although Ang I concentration was lower and ACE activity and aldosterone concentration higher in severe CHF patients. ACE-only treated patients had decreased ACE activity and AGT concentrations than ARB-only treated patients, but no differences in the other parameters.

Conclusions: CHF, and the associated RAS blocking drug treatment, alters the distribution pattern of RAS components beyond the classic peptides and enzymes. Ang I and II are susceptible to digestion at several sites by angiotensinases-peptidases that remove amino acids sequentially from the amino terminus (aminopeptidases) or the carboxyl terminus (carboxypeptidases), or cleave peptide bonds in the interior of the molecule (endopeptidases). Further experiments will clarify whether the production of other angiotensin peptides may underline these results.

PP.32.26 THE POLYMORPHISM OF ENDOTHELIAL NITRIC OXIDE SYNTHASE IS ASSOCIATED WITH POOR ENDOTHELIUM-MEDIATED VASODILATATORY RESPONSE AND WORSE CLINICAL PROGNOSIS IN CHRONIC HEART FAILURE

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Objective: 104 stable ischemic chronic heart failure (CHF) patients (pts) with left ventricular (LV) systolic dysfunction (LV ejection fraction less 45%) and concomitant essential hypertension (EH) were examined.

Design and method: Flow-mediated vasodilation (FMD) of a. brachialis was carried out by standard culf test. Endothelial nitric oxide synthase (eNOS) T(-786)C polymorphism was genotyped by polymerase chain reaction. 30 month prognosis (combined death/heart failure hospitalization data) was evaluated by Kaplan-Meier method.

Results: FMD in TT homozygote pts (n=40) was comparable to those with heterozygote TC pts (n=45): 7,2 [4,9; 8,3]% versus 6,6 [4,4; 9,1]% (p=0,977), respectively. In CC homozygote pts (n=19) significantly worse FMD 4,7 [2,8; 6,0]% was observed in comparison with TT group (p=0,034) and TC group (p=0,046). Simultaneously, CC homozygote pts demonstrated significantly worse combined death/hospitalization rate at 30 month follow-up as compared with TT homozygote group (log-rank = 5,978, p = 0,010), (Fig.).

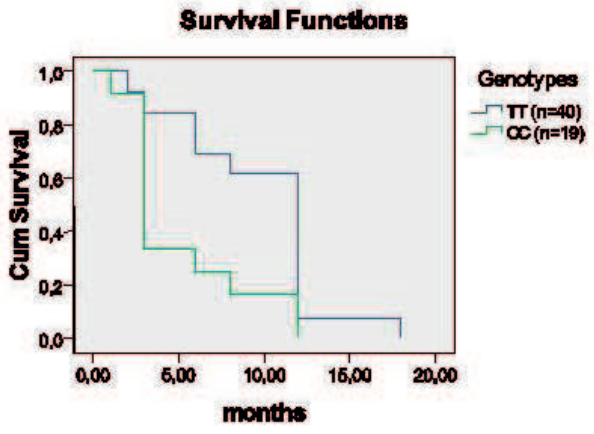

Figure. Kaplan-Meier curves for outcomes of pts with TT and CC genotypes of T(-786)C eNOS gene

There were no significant differences in above-mentioned combined outcome between TT and TC groups.

Conclusions: In stable ischemic systolic CHF with concomitant EH CC T(-786) C eNOS genotype is associated with worse FMD response and worse long-term outcome versus TT T(-786)C eNOS genotype.

PP.32.27 ASSOCIATION OF ELEVATED RED CELL DISTRIBUTION WIDTH VALUES WITH CLINICAL OUTCOMES IN HEART FAILURE WITH PRESERVED EJECTION FRACTION PATIENTS

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Objective: Red cell distribution width (RDW) is one of the novel prognostic biomarkers in heart failure. To date, studies have included patients with both preserved and low left ventricular ejection fraction. We aimed to evaluate the prognostic significance of high RDW values in hospitalised patients with heart failure with preserved ejection fraction (HF-PEF) primarily due to arterial hypertension.

Design and method: Patients hospitalised with HF-PEF (n=139) with at least one in-hospital RDW measurement were included. Relevant laboratory and clinical parameters obtained during admission were also collected. Patients were followed up at a mean time of 1.1± 0.1 years with phone interviews and assessment of all-cause mortality (primary end point) and all-cause hospitalisations (secondary end point). Patients with high and low RDW values with the distinction based on the previously calculated cut-off point (14.43%) were compared by the means of logistic regression. Relative risks (RR) were calculated with the use of crosstabulation tables. A multivariate analysis was then conducted with adjustment for other individually significant prognostic markers.

Results: The majority of patients were female (63%), mean age was 73±11 years old, and the proportions of participants with NYHA class II, III and IV heart failure were 41.7%, 46.8% and 11.5% respectively. The risk of death was significantly higher for patients with RDW values above 14.43% (RR = 2.73, 95% confidence interval [CI] 1.78-4.20, p=0,001; odds ratio [OR] 8.51, 95% CI 2.18-33.13, p=0.002). The risk remained elevated after including other risk factors (i.e., glomerular filtration rate and NYHA class) in the multivariate analysis (OR = 6.90, 95% CI 1.56-30.44, p=0,011). After adjustment for the presence of anemia mortality was still higher in those with higher RDWs although it lost statistical significance (OR = 4.51, 95% CI 0.96-21.22, p=0.057). The rate of all-cause hospitalisations did not differ significantly between patients with high and lower RDW values (RR = 1.54, 95% CI 0.92-2.57, p>0.05; OR 1.92, 95% CI 0.88-4,19, p>0.05).

Conclusions: Higher RDW values in patients with HF-PEF are associated with all-cause mortality. However, the interaction of RDW with anemia deserves further investigation. RDW does not predict subsequent all-cause hospitalisations.

PP.32.28 HYDRATION STATUS IN PATENTS WITH ACUTE DECOMPENSATED HEART FAILURE AND ACUTE CARDIORENAL SYNDROME

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Objective: Patients with acute decompensated heart failure(ADHF) are usually admitted with severe systemic congestion. Volume overload is the known main driver for morbidity, mortality and hospital readmission. Acute cardiorenal syndrome(CRS) is the common complication among patients with ADHF and occurs up to 45% of this population. Bioimpedance vector analysis(BIVA)-non-invasive, accurate technique for hydration status evaluation. The aim: to determine the hydration status in patients with ADHF by BIVA and to evaluate the association of fluid status with acute CRS, short-term and long-term outcomes.

Design and method: In 183 patients admitted with ADHF(125male, 69±9 years(M±SD),arterial hypertension 87%,ischemic heart disease 56%,myocardial infarction 53%,diabetes mellitus 36%,known chronic kidney disease 40%,ejection fraction 44±15%) fluid status was assessed by BIVA. Hydration status was expressed using resistance(R) and reactance(Xc),standardized by height. Acute kidney injury(AKI) was defined using KDIGO Guidelines. Mann-Whitney and Spearman tests were performed. P<0.05 was considered statistically significant.

Results: 87% of patients were overhydrated,64% of them had severe hyperhydration, assessing by BIVA.41% of patients developed acute CRS. Severe hyperhydration was diagnosed in 72% of patients with acute CRS and 44% of patients without CRS ($\chi2$=13.6,p<0.001). The patients with AKI demonstrated higher volume overload compared with patients without AKI: lower levels of both R and Xc (222±48 vs 251±62,p<0.001 and 18±7 vs 22±6Om/m,p<0.001). Patients with CRS and its poor outcomes(30-days mortality and re-hospitalization for 6 month) compared with patients without these conditions had lower levels of R and Xc (202±57 vs 250±51,p<0.001; 15±7 vs 24±6Om/m,p<0.001). Patients with acute CRS compared with patients without CRS had more marked clinically presentation of systemic congestion: orthopnea (84% vs 67%,$\chi2$=6.9,p<0.01),acrocyanosis (79% vs 64%,$\chi2$=6.9,p<0.01), jugular venous distension (56% vs 37%, $\chi2$=6.4, p<0.05), hepatomegaly (79% vs 60%, $\chi2$=6.9, p<0.01), higher respiratory rate on admission (25±3 vs 23±3, p<0.01), higher Borg dyspnea index (8.4±2.0 vs 7.6±1.6, p<0.01), but there were found no difference between EF and blood pressure levels.

Conclusions: 87% of patients admitted to the hospital with ADHF diagnosed with overhydration. Severe hyperhydration more often occurs in patients with acute CRS. Patients with acute CRS and worse outcomes had more severe hyperhydration compared with patients without renal deterioration. Evaluating hydration status by BIVA added useful information to standard clinical parameters and could help to determine the patient population with higher risk of development of acute CRS and its poor outcomes.

PP.32.29 BIOMARKERS AS DETERMINANTS OF POOR OUTCOMES IN PATIENTS WITH ACUTE KIDNEY INJURY AND DECOMPENSATED HEART FAILURE

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Objective: Acute decompensated heart failure(ADHF) is one of the leading causes of hospitalization worldwide. The development of acute kidney injury(AKI) is associated with poor outcomes. There is a strong need to detect AKI before serum creatinine(SCr) rise. The aim:to determine the AKI in ADHF patients, to evaluate the association of urine neutrophil gelatinase associated lipocalin(uNGAL) and kidney injury molecule-1(KIM-1) with changes in kidney function and outcomes.

Design and method: In 51 patients with ADHF(18 male,70±9 years(M±SD), arterial hypertension 92%, ischemic heart disease 56%, myocardial infarction 67%, diabetes mellitus 27%, known chronic kidney disease 33%) levels of SCr, uNGAL and KIM-1 were determined on admission.AKI was defined using 2012KDIGO Guidelines. Patients with AKI were classified into four groups on the basis of their levels of SCr, uNGAL and KIM-1. Mann-Whitney and multiple logistic regression analysis were performed.P<0.05 was considered statistically significant.

Results: 53% of patients developed AKI. Patients with AKI compared with patients without AKI had higher SCr(189±94 vs 115±50 mkmol/l,p<0.001), uNGAL(203±271 vs 11±6 ng/ml,p=0.001). Levels of KIM-1 did not differ(0,454±0,266 and 0,305±0,208,p>0.05). Urine NGAL>184ng/ml (odds ratio(OR) 3.85; 95% confidential interval(CI) 2.4-6.1) was determined to be significant and independent factor for development of AKI. Urine KIM-1>0.41ng/ml (OR 2.85;95% CI 1.8-5.9) was determined to be significant and independent factor for ADHF rehospitalization after AKI. Of 27 patients with AKI 15% had two criteria of AKI [NGAL(+)/KIM-1(+)], 18,5%-isolated increase of SCr, 29,5%-[Scr(+)/KIM-1(+)] and 37%-[SCr(+)/NGAL(+)]. Patients with NGAL(+)/KIM-1(+) and with SCr(+)/NGAL(+) compared with other groups demonstrated transient character of AKI and the higher risk of 30-days mortality: all patients NGAL(+)/KIM-1(+), 50% of patients NGAL(+)/SCr(+) died in 30 days. There were no deaths in 30 days in patients with AKI and isolated increase of SCr and patients SCr(+)/KIM-1(+).

Conclusions: 53% of patients admitted to the hospital with ADHF developed AKI. Level of uNGAL>184ng/ml and KIM-1>0.41ng/ml in patients with AKI is associated with persistent character of AKI and higher risk of 30-days mortality. The use of uNGAL together with KIM-1 might be useful for the clinician to suspect the subgroup with high risk of mortality in patient population with ADHF and AKI.

PP.32.30 J CURVE PHENOMENON. AN ANALYSIS OF BLOOD PRESSURE AND CARDIOVASCULAR EVENTS IN HYPERTENSIVE PATIENTS WITH CORONARY ARTERY DISEASE AND IMPAIRED SYSTOLIC FUNCTION

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Objective: Low blood pressure is associated with worse outcome in hypertensive patients with coronary heart disease. A J curve phenomenon has been reported between blood pressure and cardiovascular events in those patients. The purpose of the study was to determine the relationship between on-treatment BP and cardiovascular outcomes (death or heart transplantation) in hypertensive patients with CAD and impaired left ventricle systolic function.

Design and method: We prospectively followed-up 75 hypertensive patients with coronary heart disease and impaired left ventricular function for 28.1±9.9 months. During this period, 14 patients died and 2 underwent heart transplantation. Blood samples for NT-proBNP assessment were taken at baseline and before cardiopulmonary exercise to estimate peak oxygen consumption (VO2)). LV cavity diameter, left atrial size and LV ejection fraction were measured by echocardiography. A cut off point of 120/70 mmHg was used in order to differentiate patients with low and high blood pressure (according TNT trial results).

Results: Patients with BP levels < 120/70 mmHg presented increased NT pro BNP plasma levels (2169±2010 vs 1131±1221, p=0.018), at baseline and peak exercise (3070±2492 vs 1362±1373, p=0.016) in confront to patients with BP > 120/70 mmHg, worse peak VO2 levels (13.5±3.8 vs 17.7±4.7, p=0.001) and increased VEV02 (47.2± 11.9 vs 40.2± 12.3, p=0.032) and VEVCO2 slopes (41.3±9.3 vs 36.2± 7.6, p=0.02) respectively. In addition, patients with BP<120/70 mmHg, were on worse NYHA class (2.5± 0.6 vs 1.97 ±0.8, p=0.004) and presented decreased inotropic and chronotropic response to exercise (peak SBP at exercise 134.8 mmHg ± 27.6 vs 170.4± 24.5 mmHg, p<0.001) and (peak HR at exercise 121.4±19.4 bpm vs 136± 22.1 bpm, p=0.013) respectively. Finally, there was a trend for worse survival in patients with BP <120/70 mmHg as well as increased left ventricle and atrial dimensions, without however a statistical significance.

Conclusions: Blood pressure levels < 120/70 mmHg are associated with worse clinical condition while there was a trend for worse outcome. More studies with larger sample are needed in order to verify a J curve phenomenon between blood pressure and cardiovascular events in hypertensive patients, with CAD and impaired systolic function.

PP.32.31 HYPERTENSION IN HEART FAILURE OF ISCHEMIC ETIOLOGY. RISK FACTOR OR COMORBIDITY?

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Objective: Recent data showed that hypertension, as comorbidity, is present in 84.2% patients with heart failure older than 65 years and in 80.7% younger than 65 years. However, in heart failure, with the contribution of ischemic heart disease as primary cause, the underlying hypertension is often considered as risk factor rather than comorbidity. Aim was to investigate the prevalence of hypertension in patients with heart failure of ischemic etiology.

Design and method: This prospective research included 150 patients with heart failure of ischemic etology, treated in Clinic of Cardiology, University Clinical Center Kragujevac from June 2010-June 2011. Data used for analysis were history of prior hypertension; prior antihypertensive therapy and blood pressure levels on admission after 5 minutes of rest in a supine position, and before discharge, both classified according to the VII JNC recommendations for confirmation of hypertension. All data were stored in a specially designed database, and statistically analyzed in the SPSS for Windows. Results were compared to those obtained from another research which included 150 patients with acute myocardial infarction with/without ST-segment elevation.

Results: Mean age was 72.66±8.45 years with 81.3% older than 65 and 18.7% younger than 65 years (x2 test;p=0.000). Prior hypertension was present in 78.7% in >65 years, 67.9% in <65 years and 76.7% in total group with statistical significance (x2 test;p=0.000). Only 40% of patients used antihypertensives prior to hospitalization. Mean values on admission vs discharge were for systolic blood pressure 144.63±27.64 vs 128.04±18.68 and for diastolic 81.92±15.64 vs 75.34±13.08. Comparison to the results obtained from the previous research on 150 patients with acute myocardial infarction with/without ST-segment elevation showed that hypertension is more prevalent in heart failure (HF-76.7% vs AMI-70.7%).

Conclusions: Higher prevalence of hypertension in group older than 65 was due to a higher distribution of those patients. Although ischemic heart disease is a leading cause of heart failure, with these results we give higher significance to hypertension as comorbidity rather than risk factor in heart failure of ischemic etiology considering that it had higher prevalence in ischemic heart failure than in acute myocardial infarction.

PP.32.32 REDUCTION OF HYPERTENSIVE INDUCED HFPEF BY INHIBITION OF LATE SODIUM. INFLUX WITH RANOLAZINE: A FOLLOW-UP

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Objective: The heart failure with `preserved´ejection fraction – HFpEF- (or diastolic relaxation disorder) is a sign of leftventricular dysfunction induced by a long-term hypertension. It is observed as well despite effective treatment with antihypertensive drugs. The analysis and quantification of the diastolic relaxation disorder is feasible using Doppler-echocardiography by registration of the E´A´-ratio. Typical clinical symptoms are dyspnea and angina equivalents.
An influence on the heart failure with `preserved´ ejection fraction may be induced by the drug ranolazine. Ranolazine inhibits the ischemic generated late sodium influx (I Na-late) and reduces consequently the ischemic induced intracellular sodium – and calcium-overload. Upon this mechanism the calcium dependent diastolic leftventricular wall tension will be decreased.
We hypothesized that ranolazine will improve hypertensive induced diastolic dysfunction through this mechanism.

Design and method: We extended our investigation on 15 hypertension-patients (72,7 ± 9,8years) with exclusion of a macrocoronary induced ischemia, which complained of dyspnea and/or angina equivalents under exercise. A coincidental exercise induced hypertension was excluded. Despite efficient continuation of the antihypertensive drugs all these patients showed a diastolic relaxation disorder. After educational advertising ranolazin (375 mg, 2x d.) was administered additionally.

Results: During the observation the blood-pressure and the heart rate showed no alteration. The patients by themselves reported a subjective amelioration. After 10,3±3,1 days a significant (p=0,001) decrease of the diastolic relaxation disorder was found in the control of tissue-doppler-measurement (initial E´A´-ratio=0,598 ± 0,131 ; E´A´-ratio under ranolazine=0,766±0,179). This normalization of the E´A´ -index (as parameter of diastolic relaxation disorder) was observed in all 15 patients.

Conclusions: The addition of ranolazine to efficient antihypertensive drug therapy in hypertensive patients resulted in an amelioration of symptoms like dyspnea and angina equivalents.In this context a significant (p=0,001) decrease of the diastolic relaxation disorder was found in the tissue-doppler-measurement with normalization of the E´A´-index (as parameter of diastolic relaxation disorder). There was no change of blood pressure or heart rate. Our observation warrants controlled randomized studies on the effects of ranolazine in patients with hypertensive induced heart failure with `preserved´ ejection fraction.

PP.32.33 HYPERTENSION AND OTHER RISK FACTORS IN HEART FAILURE PATIENTS. RESULTS FROM CRO-HF REGISTRY

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Objective: Cardiovascular risk factors are very important in development of heart failure (HF). The aim of the study was to analyse the frequency of hypertension and other risk factors in patients with HF.

Design and method: The CRO-HF Registry was established in 2005 as online registry. A total of 2203 in-hospital HF patient were analyzed: 1028 (46.7%) females (f) and 1175 (53.3%) males (m); median age was 76 y. Preserved left ventricular systolic function (LVEF>=50%) was recorded in 37.8% patients.

Results: History of hypertension (AH) was recorded in 67.5% patients, diabetes mellitus (DM) in 34.4%, myocardial infarction in 22.7%, renal insufficiency in 19.2%, COPD in 17.3%, and cerebrovascular disease in 16.5% patients. Hypertension had 58.7% females and 52.7% males.
Active smoking habit had 11.1% patients and 15.6% patients were former smokers. COPD had 30.6% active smokers and 24.8% former smokers. According to body mass index (BMI), overweight was 46.3% patients and obese-25%.
Lower levels of haemoglobin was recorded in 51.9% patients, higher levels of creatinine in 46.8%, ALT in 29.8%, cholesterol in 32.7%, tryglicerides in 31.9%, uric acid in 79.3% and hyperglycaemia in 99.8% patients. Females had higher values of ALT (f-33%, m-27%, P=0.012), cholesterol (f-36.8%, m-29.1%, P=0.009), tryglicerides (f-36.1%, m-28.3%, P=0.014), and uric acid (f-82.9%, m-76.4%, P=0.007). Opposite to expectation, males had lower haemoglobin levels (m-58%, f-44.8%, P<=0.001).
The frequent precipitating factors of HF were hypertension (55.5% patients), arrhythmia (51.3%), valvular heart disease (32.8%), acute coronary sindrom-ACS (19.7%), and infections (19.6%). In-hospital mortality rate was 13.8%.

Conclusions: Hypertension was considerable underline disease of HF close to diabetes mellitus, myocardial infarction, renal insufficiency and COPD. Overweight or obese was almost two third of HF patients, and one third was active or former smokers. The most important “triggers” of HF were hypertension, arrhythmia, ACS, and infections.

PP.32.34 CHRONIC HEART FAILURE CORRECTION IN PATIENTS WITH RENOCARDIAC SYNDROME

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Objective: Patients who entered the study EUCLID, demonstrated nephroprotective effect of lisinopril, which reduces the appearance of microalbuminuria. Aim. Study the effectiveness of lisinopril in the correction of chronic heart failure (CHF) in patients with chronic renocardiac syndrome based on a study of left ventricular left ventricular (LV) diastolic function.

Design and method: 59 patients with chronic renocardiac syndrome were investigated, namely, hypertension in chronic glomerulonephritis aged 16-74. Control group consisted of 25 patients. All patients received lisinopril 10-20 mg per day.

Results: A significant decrease in the rate of diastolic filling by passive relaxation (E) of 23.4% and a filling rate due to atrial contraction (A) at 20%. Violation of intracardiac hemodynamics as manifested by increasing the restrictive properties of the myocardium, as well as reducing the effectiveness of time and deceleration rate of early LV filling flow by 23.2 and 27.4%, increase and decrease of LV filling time active by reducing atrial 49.9% . Decreased as the time of isovolumic LV relaxation of the heart. During treatment with lisinopril was an increase in ejection fraction (EF) of 16.4% (p=0.004) or 53.2% (49.1, 58.9) to 61.9% (53.4, 68.0). The increase in ejection occurs due to the normalization of the hemodynamic and volumetric parameters of LV and by improving LV diastolic function. Thus, the rate of mitral filling period of relaxation (Ve) increased from 0.53 m/s (0.43, 0.58) to 0.56 m/s (90.47, 0.63), or 5.7 % (p=0.039), while maintaining the diastolic filling due to atrial contraction. This has led to the restructuring of diastolic filling of the normal type, which was confirmed by the change of the reflectance upwards: Ratio of Ve/Va to treatment was 1.45 units. (1.02, 1.63), and during treatment - 1.58 units (1.21, 1.90), or a 9.0% increase (p = 0.013). Equally, there was a decrease IVRT: from 61.9 ms (54.6, 78.8) to 56.4 ms (50.3, 72.4) or 8.9% (p=0.044).

Conclusions: Improvement of LV diastolic function is due to improved myocardial relaxation. Lisinopril reduce the degree of diastolic dysfunction by improving myocardial relaxation in patients with chronic renocardiac syndrome.

PP.32.35 USEFULNESS OF SLOW BREATHING TRAINING IN CHRONIC HEART FAILURE. STUDY DESING AND INTERMEDIATE RESULTS

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Objective: Slow breathing has favourable acute effects in chronic heart failure (CHF) patients. Aim of this study is to test the feasibility and efficacy of a new nonpharmacological CHF treatment method based on slow breathing training (SBT).

Design and method: The study is an ongoing cross-over open trial where patients, in random order, undergo a 10-12 week period of SBT with RESPeRATE device (InterCure Ltd., Lod, Israel) and a 10-12 week follow-up under usual care. Patients randomized to SBT are asked to perform each day two separate 15-min sessions of device-guided SBT at a breathing frequency of 6 breaths per minute. In all patients, before the enrollment and after each phase clinical data collection, polysomnography, autonomic testing, echocardiography, 6 minute walking test (6MWT), 24-h Holter monitoring, Minnesota quality of life questionnaire and laboratory tests are performed.

Results: Until now 40 pts have entered the study with the following baseline characteristics: age 64.0±10.7 years, 34M/6F, 30 with ischemic CHF, NYHA Class II: – 33, Class III – 7, left ventricular ejection fraction 30.2±7.3%, hypertension - 27, history of stroke - 5, diabetes - 14, apnea-hypopnea index (AHI) 13.4±13.3. So far 15 of them have completed the study. Thirty seven patients had no relevant adverse events in the course of the study and those who initiated SBT tolerated it well. Three patients interrupted the study (2 of them for CRT pacemaker implantation, 1 - myocardial infarction during the study but without time relation to SBT). Compared with baseline values in subjects who completed SBT phase 6MWT distance increased (from 458 to 489 m, p<0.005), AHI decreased (14.7 to 8.9, p<0.01), NT-proBNP and LV ejection fraction remained unchanged.

Conclusions: Preliminary data indicate that SBT is feasible and safe in CHF subjects and suggest an improvement in functional capacity and in sleep disordered breathing severity. If these results are confirmed in a larger sample, they may support SBT as a novel and useful component of cardiorespiratory rehabilitation programmes in CHF.

PP.32.36 PHYSICAL PERFORMANCE IN ELDERLY SUBJECTS AFFECTED BY LEFT VENTRICULAR DIASTOLIC DYSFUNCTION

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Objective: Aim of this study was to evaluate the differences in physical performance connected to the left ventricular diastolic dysfunction (LVDF) features in elderly subjects affected by hypertension.

Design and method: 140 elderly subjects were included (F 77-M 63-aged 77 + 12 years) who all had a history of hypertension and a preserved systolic function assessed through colordoppler echography.We split subjects in 3 groups selected according age: group A:54 patients aged 66-75; group B:52 patients aged 76-85;group C:40 patients aged >85.In all subjects both left ventricle and atrium were evaluated morphologically and functionally.Left ventricular hypertrophy was detected through the criteria:ILVM>125/110 gr/m2; LVM/h>51/47 gr/h 2.7. Left ventricular diastolic function is evaluated through transmitral flow:E/A>1.5-1;DT=160-240 msec;IVRT=70-90 msec. The physical performance was assessed through the Short Physical Performance Battery (SPPB) which results in a combination of a balance test according to 3 increasingly difficult positions,a walking test on a 4-metre-course and a standing-up test from a chair,and whose final SPPB score was comprised between 0 and 12.

Results: Of all patients 72% had left ventricular hypertrophy:24% showed growth of left atrium;15% had left ventricular diastolic malfunction.Prevalence of left ventricular hypertrophy was larger in group B compared to group A.Atrial growth and left ventricular diastolic malfunction were more prevalent in group B and C compared to group A, too.We detected that the prevalence of left ventricular hypertrophy progressed with the growing of left atrium and left ventricular diastolic malfunction related to the older age (p<0.001).We also did not find a significant connection in elderly people from groups B and C between the left ventricular mass and the left ventricular diastolic function scores.Furthermore we detected another significant connection between the reduced physical performance, ranging between 5 and 9 in SPPB,and a worse condition of LVDF in subjects belonging to groups B and C (p>0.01).

Conclusions: Through the analysis of results we found out that the connection between left ventricular hypertrophy and the malfunction of left diastolic ventricular function is age-dependant,and that the reduction of physical performance con be considered a frailty marker in elderly people affected by hypertension and LVDF.

PP.32.37 BASELINE FUNCTIONAL LEFT VENTRICLE CONDITION AND LONGTERM OUTCOME IN VERY HIGH RISK ESSENTIAL HYPERTENSIVE PERSONS

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Objective: To assess retrospectively total mortality of essential hypertensive persons with left ventricular hypertrophy (LVH) depending on baseline condition of left ventricle function.

Design and method: Using Kaplan-Meier method there was made total mortality estimation of 393 patients (mean age 64,6 ± 6,3 years; 62% - males) with concentric or eccentric LVH, hospitalized in therapeutic clinic in period of 2005-2009 years. Mediana of retrospective observation constituted 4,9 years. LV myocardial mass index constituted 150±25 g/m². All patients had sinus rhythm at the moment of initial echocardiography. Systolic and diastolic functions were studied on ejection fraction (EF, %) and relation Ve/Va (units) respectively. Data are specified as mean ± standard deviation (M±δ) or as percents (%).

Results: Total mortality up to the moment of the study end constituted 36% among LVH patients. Mortality constituted 57% in persons with EF<40%; 45% in subjects with EF<50%; 40% in patients with EF<60%; 36% in persons with EF<70%. Mortality was equal to 44% in persons with Ve/Va<0,5 units; 38% in subjects with Ve/Va=0,5-0,69 units; 29% in patients with Ve/Va=0,7-0,89 units; 25% in persons with Ve/Va =0,9-0,99 units; 38% in pa-

tients with Ve/Va=1,0-1,5 units; 41% in persons with Ve/Va>1,5 units.

Conclusions: The five-year mortality is linearly dependent on the baseline left ventricular ejection fraction, but has u-shaped relationship with values of the baseline ratio Ve/Va in essential hypertensive patients with very high cardiovascular risk.

PP.32.38 SUBENDOCARDIAL VIABILITY RATIO DETERMINED FROM THE RADIAL PRESSURE PULSE IS ASSOCIATED WITH PLASMA B-TYPE NATRIURETIC PEPTIDE IN HEART FAILURE

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Objective: Plasma levels of B-type natriuretic peptide (BNP) are associated with severity of heart failure (HF) [1]. Cardiac function in HF has increased dependency on myocardial oxygen consumption. Oxygen demand can be estimated from the arterial pressure wave by the systolic tension time index (STI) and oxygen supply from the diastolic time index (DTI). The subendocardial viability ratio (SEVR=DTI/STI) when computed from the aortic pressure is related to degree of subendocardial myocardial perfusion [2]. This study assesses the relationship between plasma BNP and SEVR when determined from the radial pressure wave in HF patients.

Design and method: Patients (n=17; 7 females; age 67.5 ± 10.5 (SD) years) diagnosed with HF according to the New York Heart Association (NYHA) classification (II [n=7]; III [n=7]; IV [n=3] underwent non-invasive measurement of radial pulse waveform (tonometry), blood pressure (BP), left ventricular ejection fraction (LVEF, echocardiography) and plasma BNP concentration (chemiluminescence, Architect ci16200, Integrated System). SEVR (average of at least 10 consecutive radial pulses) was computed from STI and DTI using ejection duration (ED) determined from the beginning of the pulse to the dicrotic notch.

Results: Plasma BNP concentration increased and SEVR and LVEF decreased with NYHA class severity of HF. For the whole cohort there was a significant correlation between SEVR and BNP (pg/ml) (SEVR = - 0.0002BNP + 1.64; r = 0.7; p<0.05) for a BNP range of 347 to 4293 pg/ml. Increasing tertiles of BNP were associated with significant decrease in SEVR (p<0.05) but not with changes in heart rate, age, systolic BP or ED. Separate measurements showed a high correlation (r > 0.9) between SEVR from the radial pulse and SEVR from the corresponding derived central aortic pressure pulse (SphygmoCor, AtCor Medical).

Conclusions: SEVR computed from the radial pulse has an inverse relationship with plasma BNP in HF. Further studies will aim to assess whether the addition of SEVR as a screening parameter will improve the HF discriminating power of BNP measurement.

PP.32.39 HIGH BLOOD PRESSURE SEEN AT THE OTHER END OF THE CARDIOVASCULAR CONTINUUM IN AN ALGERIAN HOSPITAL IN REAL LIFE

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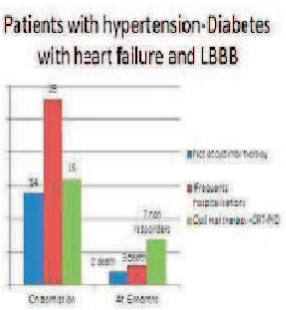
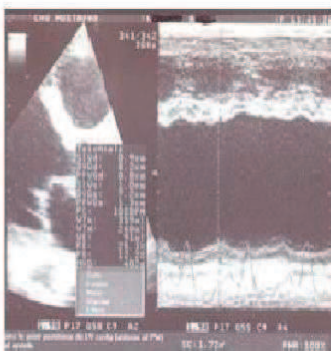
Objective: Numerous works have analyzed the hypertensive patient at the beginning of the cardiovascular continuum but what about the other end of the continuum? That is why we analyze in our department hypertensive-diabetic patients with heart failure, left bundle branch block and persistently reduced ejection fraction despite optimal pharmacological therapy.





Design and method: Between June 2011 and Mars 2013 among a total of 175 consecutive patients (pts)with heart failure and left bundle branch block (LBBB), we meet 58 hypertensive-diabetes pts (33%), mean age 65± 11 years (range 42-82 years) 27 women /31men with persistently reduced ejection fraction despite optimal pharmacological therapy and left bundle branch block (LBBB) underwent clinical examination, a 12-leads ECG Transthoracic echocardiography to evaluate left ventricular ejection fraction (LVEF); left ventricular end-diastolic diameter(LVEDD); left ventricular end-systolic diameter(LVESD) and dyssynchrony parameters.

Results: NYHA class: III=72%, class IV=28%; 85% on sinus rhythm, 10% on atrial fibrillation, 5% with right ventricular pacing.
QRS wide 149±18 (120-180); ischemic heart disease 60%), non ischemic: 40%.
Mean LVEDD: 61.7±10.7mm; Mean LVEF= 30±10%; interventricular dyssynchrony >40ms present in 51% and intra-ventricular dyssynchrony in 40% of cases.
Cardiac resynchronisation therapy (CRT with pacemaker functionCRT-P):9 ;CRT with defibrillator function (CRT-D):7
26 (44%) dont'meet the conditions for CRT: NYHA function class IV with frequent hospitalisations.
At optimal therapy, four drugs therapy: sartans or ACE inhibitors +MRA+beta-blocker+ Thiazide diuretic: 16 patients.
Among 16 patients with CRT-P/CRT-D, only 9 patients(56%) with favorable response with inverse remodelling; 43% of hypertension and heart failure with LBBG do not respond to CRT.

Conclusions: Scar burden take an important value in this hypertension diabetic with terminal heart failure pts and 43% of them do not respond to CRT. While more European population is now at lower CVD risk, our population meets a significant number of patients with a heavy morbidity and leads to an importance expense for our country. One of the main solutions is to motivate all practitioners to ensure that their patients regardless of their reason for consultation are at the objective clearly outlined by the European recommendations.

PP.32.40 PROGNOSTIC VALUE OF VENTRICULAR-ARTERIAL COUPLING IN PATIENTS WITH ARTERIAL HYPERTENSION AND HEART FAILURE WITH REDUCED EJECTION FRACTION

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Objective: The aim of the study was to determine the prognostic role of ventricular-arterial coupling (VAC) in patients with arterial hypertension (HTN) and stable heart failure with reduced ejection fraction (HFrEF).

Design and method: In prospective study (median follow-up 18 months) prognosis of 93 stable patients (75% male, age 64±9 years (M±SD), history of myocardial infarction 67%, diabetes mellitus 32%, blood pressure (BP) 131±14/80±10 mmHg, heart rate 75±13/min, II/III NYHA class 25/75%) with HTN, symptoms and signs of HF, left ventricular (LV) EF <40% (34±5%) and N-terminal pro brain natriuretic peptide >100 pg/ml (650±679 pg/ml) was studied. Adverse outcomes included all cause death or first HF hospitalization. Clinical and demographic parameters, parameters of LV function, VAC and arterial stiffness were included in multivariate analysis. P<0.05 was considered significant. 2-dimentional echocardiography was used to assess arterial elastance (Ea) and end-systolic LV elastance (Ees). VAC was assessed as the ratio Ea/Ees. Arterial stiffness was assessed using applanation tonometry.

Results: Adverse outcomes were revealed in 39% of patients (15% deaths, 24% hospitalizations). The following factors increased the risk of adverse outcomes: LVEF <25% (odds ratio (OR) 26.1, 95% confidential interval (CI) 24.9-27.3), index of VAC >3.3 (OR 23.3, 95% CI 22.1-24.5), stroke work (SW)/pressure-volume area (PVA) <38% (OR 8.2, 95% CI 7.0-9.4), augmentation index (AI) >25% (OR 2.3, 95% CI 1.3-3.2), time to reflected wave (Tr) <135 ms (OR 2.1, 95% CI 1.2-3.0). Pulse wave velocity >15 m/s (OR 5.4, 95% CI 3.7-7.1), office systolic BP <120 mmHg (OR 5.1, 95% CI 4.2-6.0) were associated with increased risk of HF hospitalizations. AI >35% (OR 7.3, 95% CI 5.9-8.6), office systolic BP <120 mmHg (OR 3.4, 95% CI 1.3-5.5) and diastolic BP <70 mmHg (OR 3.4, 95% CI 1.3-5.5), Tr <116 ms (OR 2.3, 95% CI 1.1-3.5), SW/PVA <48% (OR 2.3, 95% CI 1.1-3.5) were associated with increased risk of all-cause death.

Conclusions: Parameters of VAC and arterial stiffness have independent prognostic value as well as LVEF and office BP in patients with HTN and HFrEF. Assessment of VAC via Ea/Elv can be used for stratification of patients with HFrEF.

PP.32.41 ACQUIRED ARTERIOVENOUS FISTULA OF THE RIGHT COMMON ILIAC ARTERY AND LEFT COMMON ILIAC VEIN AND BILATERAL LOWER EXTREMITY DEEP VENOUS THROMBOSIS IN A WOMAN PRESENTING AS HIGH OUTPUT

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Objective: We aim to present a case of acquired arteriovienous fistula of the right common iliac artery and left common iliac vein with extensive collateralization in a female who presented with high output congestive heart failure eighteen years after sustaining a gunshot wound.

Design and method: Case Report.

Results: Acquired intra-abdominal arteriovenous fistulas (AVFs) are a rare disorder where the communication most commonly occurs between abdominal aorta and inferior vena cava. Ilioiliac AVF has been reported previously, but is exceedingly rare. A 36-year old female presented with complaints of shortness of breath and abdominal enlargement. Eighteen years prior to consult, she sustained a gunshot wound through the abdomen for which she underwent surgical exploration with an uneventful recovery. Over the past five years, she had been experiencing progressive heart failure associated with abdominal enlargement and bilateral lower extremity edema. Cardiac examination revealed a right ventricular and left ventricular heave. CT aortogram was eventually done which revealed findings compatible with an arteriovienous fistula of the right common iliac artery and left common iliac vein with extensive collateralization. Lower extremity venous duplex scan showed right lower extremity deep venous thrombosis (DVT) of common and superficial femoral vein, acute partially occluding, with deep venous insufficiency and perforator incompetence; and left lower extremity DVT of the Iliac vein. The final diagnosis was congestive heart failure from high output heart failure secondary to ilioiliac fistula (right common iliac artery and left common iliac vein), right common iliac artery aneurysm and bilateral DVT. Surgical repair was strongly advised however the patient refused surgery. The patient was managed with optimal medical therapy.

Conclusions: A thorough history and a physical examination are still indispensible tools that aid the physician in diagnosing such an uncommon condition. In conclusion, it is prudent to include AVFs (ilo-ilac, aortocaval, aortoiliac fistulas) as part of the differentials of patients with a history of penetrating abdominal injury or surgery presenting with signs and symptoms of progressive cardiac decompensation, abdominal bruits, and other signs of high output heart failure.

POSTERS' SESSION

POSTERS' SESSION PS33
RENIN-ANGIOTENSIN-ALDOSTERONE SYSTEM

PP.33.01 HRP DOES NOT HAVE EFFECT ON (P)RR BLOCKING

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Objective: (Pro)renin propeptide (HRP) is a synthetic (pro)rennin propeptide containing 10 amino acids, which is presumed to affect the binding of (pro)renin and (P)RR, thus HRP is considered as the (P)RR blocker. But whether HRP can block (P)RR, there were not consistent related results.
To investigate whether HRP can prevent prorenin from activating PI3K, AKT, NFκB, IL-6 in HUVECs through (P)RR independent of angiotensin Π (Ang Π).

Design and method: AT1/AT2 receptors of HUVECs were blocked by Olmesartan(10-5M) and PD123319(10-4M) respectively to observe the prorenin's (2×10-9M) effect on the expression of PI3K, p-AKT and NFκB-P65 in HUVECs, as well as IL-6 in cultural medium.(P)RR in HUVECs was treated by RNA interference with (P)RR - siRNA, and HRP(1×10-6M, 5×10-6M, 10×10-6M) respectively, the changes of p-AKT, P65, IL-6 were observed. The protein level was investigated in Western blot and ELISA method.

Results: Prorenin up-regulated the expression of PI3K, p-AKT, NFκB-P65, and IL-6. The activation of p-AKT, NFκB-P65 and IL-6 was inhibited by (P)RR-RNA interference..All of the three doses of HRP did not affect the activation of AKT, NFκB-P65 and IL-6 caused by renin/prorenin/(P)RR.

Conclusions: The activation of AKT, NFκB-P65, IL-6 by (pro)renin is through (P)RR. HRP does not have effect on (P)RR blocking.

PP.33.02 EFFECTS OF AZILSARTAN ON BLOOD PRESSURE, BAPWV AND RENIN-ANGIOTENSIN-ALDOSTERONE SYSTEM IN ESSENTIAL HYPERTENSIVE PATIENTS

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Objective: Azilsartan is a novel angiotensin receptor blocker being developed for hypertension treatment. We investigated the effects of azilsartan on renin-angiotensin-aldosterone system, blood pressure (BP), baPWV, and carotid IMT in essential hypertension.

Design and method: Fifty-five hypertensive patients (thirty-four males, aged 54 years) were assigned to receive azilsartan (20–40 mg once daily by forced titration) for 12 months. The 29 new patients were placed on monotherapy with azilsartan (N group) and for 26 patients currently medicated with candesartan, azilsartan was substituted for that (C group). Changes in home BP, plasma renin activity (PRA), aldosterone (Ald), estimated glomerular filtration rate (eGFR), baPWV, central blood pressure (cSBP), and carotid IMT were evaluated. In this study aldosterone breakthrough (B) was defined as any increase from an individual's baseline serum aldosterone level.

Results: Azilsartan reduced home BP (systolic/diastolic, 145.0 ± 11.0/89.2 ± 11.3 to 127.2 ± 12.3/74.9 ± 7.4mmHg) heart rate (73.9 ± 10.9 to 63.0 ± 7.0 bpm), cSBP(152.8 ± 23.4 to 128.2 ± 19.9 mmHg), baPWV(1656 ± 228 to 1414 ± 326 cm/sec), Ald (119.7 ± 59.9to 79.3 ± 26.2 pg/mL) significantly ($p<0.05$) but not PRA and IMT after 12months. A significant increase of eGFR was seen (77.9 ± 15.2 to 80.4 ±15.2 mL/min/1.73m²). The incidences of aldosterone breakthrough of azilsartan were 33% in the N group and 30% in the C group, whereas that of candesartan before changing to azilsartan was 50%. In the N group, the reductions of home BP (-29/-18 vs -18/-14), cSBP (-41 vs -14) and baPWV (-412 vs -180) in the B- group were larger than those in the B+ group.

Conclusions: These data demonstrate that once-daily azilsartan provides potent antihypertensive and antiatherosclerotic effects but lower incidence of aldosterone breakthrough than that of candesartan.

PP.33.03 AT1 RECEPTOR BLOCKADE ATTENUATES VASCULAR REMODELING IN RATS WITH PRESSURE OVERLOAD

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Objective: Vascular remodeling is an adaptive response to various stimuli, including mechanical forces, inflammatory cytokines and hormones. In the present study, we investigated the role of angiotensin II type 1 receptor activation in carotid artery remodeling in response to increased biomechanical forces using the transverse aortic constriction (TAC) rat model.

Design and method: Transverse aortic constriction was carried out on ten-week-old male Sprague-Dawley rats. Rats were treated with olmesartan (1 mg/kg/day) or/and amlodipine (0.5mg/kg/day) from day 1 to 14 days. Collagen and endothelial nitric oxide synthase (eNOS) aortas were analyzed by western blotting.

Results: Two weeks after TAC, the increased biomechanical pressures led to thickening of the medial and adventitial layers of the right common carotid artery proximal to the band (RCCA-B). This effect was accompanied by increases in adventitial collagen and immunocyte accumulation. Although no intimal thickening was observed, the level of aortic endothelial nitric oxide synthase (eNOS) was decreased in accordance with reduced acetylcholine-induced vascular relaxation in TAC carotid arteries. Treatment with olmesartan significantly prevented TAC-induced adventitial hyperplasia, collagen accumulation, vascular inflammation and immunocyte accumulation. Both olmesartan and amlodipine could improve endothelium-dependent vasodilation. However, amlodipine only partially attenuated the increase of media thickness and collagen content. Furthermore, combination of olmesartan with amlodipine has not shown any synergistic action. In addition, olmesartan significantly blocked NF-KB activation in the RCCA-B.

Conclusions: Hemodynamic changes result in the increase in the thickness of carotid arteries accompanied by altered collagen composition with endothelial dysfunction in TAC model. Inhibition of the angiotensin II type 1 receptor using olmesartan significantly attenuated the vascular remodeling associated with TAC.

PP.33.04 IMPROVED COGNITIVE FUNCTION BY ANGIOTENSIN-(1-7) IN ACE2KO MICE

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Objective: Classical renin-angiotensin system (RAS) is mainly known as angiotensin (Ang) converting enzyme (ACE)/Ang II/Ang type 1 (AT1) receptor axis which induces various organ damages including cognitive decline. On the other hand, ACE2/Ang-(1-7)/Mas axis has been known to exert antagonistic actions against the classical RAS axis in cardiovascular system. However, the roles of ACE2/Ang-(1-7)/Mas axis in cognitive function remain to be elucidated. Here, we examined possible roles of ACE2/Ang-(1-7)/Mas axis in cognitive function.

Design and method: Male 10-week-old C57BL6 (wild-type: WT) mice and ACE2 knockout (ACE2KO) mice were subjected to the Morris water maze task for cognitive function. Some ACE2KO mice (8-week-old) were administrated Ang-(1-7) (0.5 mg/kg/day) in osmotic mini-pump with or without 1 mg/ml L-arginine methyl ester (L-NAME) in drinking water. AT1 receptor blocker, azilsartan (0.1g/mg/day), was administrated to ACE2KO and WT mice (8-week-old). Cerebral blood flow (CBF) was analyzed by laser speckle flowmetry after the cognitive task. Receptor expressions were determined by real-time RT-PCR.

Results: Spatial cognitive function evaluated by the escape latency was significantly impaired in ACE2KO mice compared with WT mice. Apparent morphological differences in the brain, evaluated by hematoxylin-eosin staining, were not observed between WT and ACE2KO mice. Administration of Ang-(1-7) remarkably improved cognitive function compared with ACE2KO mice. However, this improvement was attenuated by co-administration with L-NAME,

while administration of L-NAME alone further impaired cognitive function in ACE2KO mice. Interestingly, CBF did not differ significantly between WT and ACE2KO mice. Receptor expression of AT1, AT2 receptors and MAS were not changed after Ang-(1-7) administration with or without L-NAME, while MAS receptor was about twenty times higher in the hippocampus compared with AT1 or AT2 receptors. Azilsartan improved the cognitive function of ACE2KO mice.

Conclusions: These results indicates that ACE2/Ang-(1-7)/Mas axis could play an important role in cognitive function at least in part due to the vascular response to cognitive task through the nitric oxide pathway. Regulation of ACE2/Ang-(1-7)/Mas axis could be a new therapeutic target for the improvement cognitive function. Further investigation is necessary to understand the detailed mechanism.

PP.33.05 ENHANCEMENT OF ANGIOTENSIN II TYPE 1 RECEPTOR ASSOCIATED PROTEIN SUPPRESSES VASCULAR REMODELING AND OXIDATIVE STRESS IN ANGIOTENSIN II-MEDIATED HYPERTENSION

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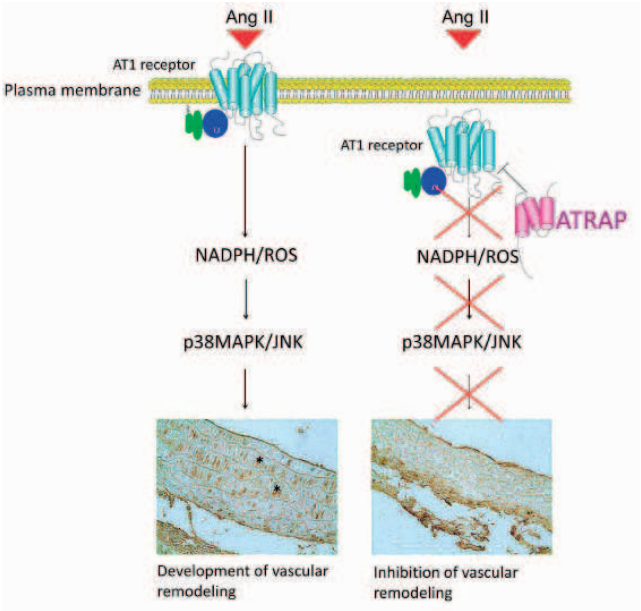
Objective: Activation of tissue angiotensin II (Ang II) type 1 receptor (AT1R) plays an important role in the development of vascular remodelling. We have shown that the AT1R-associated protein (ATRAP/Agtrap), a specific binding protein of AT1R, functions as an endogenous inhibitor to prevent pathological activation of the tissue renin–angiotensin system. In this study, we investigated the effects of ATRAP on Ang II-induced vascular remodelling.



Design and method: Transgenic (Tg) mice with a pattern of aortic vascular-dominant overexpression of ATRAP were obtained, and Ang II or vehicle was continuously infused into Tg and wild-type (Wt) mice for 14 days. First, we compared blood pressure between the Wt and Tg mice during Ang II infusion using a radiotelemetry. Second, we compared aortic vascular hypertrophy provoked by Ang II infusion between the Wt and Tg mice. Third, we compared NADPH oxidase expression and ROS production in the aorta of Wt and Tg mice during Ang II stimulation. Fourth, we compared the activation of MAPK family in the aorta of Wt and Tg mice during Ang II stimulation. Finally, we examined whether overexpression of ATRAP would suppress the Ang II-mediated NAPDH oxidase expression in VSMCs by performing the adenoviral transfer of recombinant ATRAP in vitro.

Results: Although blood pressure of Ang II-infused Tg mice was comparable with that of Ang II-infused Wt mice, the Ang II-mediated development of aortic vascular hypertrophy was significantly suppressed in Tg mice compared with Wt mice. In addition, Ang II-mediated up-regulation of vascular Nox4 and p22 phox, NADPH oxidase components, and 4-HNE, a marker of reactive oxygen species (ROS) generation, was significantly suppressed in Tg mice, with a concomitant inhibition of activation of aortic vascular p38MAPK and JNK by Ang II. This protection afforded by vascular ATRAP against Ang II-induced activation of NADPH oxidase is supported by in vitro experimental data using adenoviral transfer of recombinant ATRAP.

Conclusions: These results indicate that activation of aortic vascular ATRAP partially inhibits the Nox4/p22(phox)-ROS-p38MAPK/JNK pathway and pathological aortic hypertrophy provoked by Ang II-mediated hypertension, thereby suggesting ATRAP as a novel receptor-binding modulator of vascular pathophysiology.

PP.33.06 INTRARENAL RENIN-ANGIOTENSIN SYSTEM ACTIVITY IN RENAL FIBROMUSCULAR DYSPLASIA

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Objective: Angiotensin II (Ang II) exerts its vasoconstrictor effect via angiotensin-type-1 receptor (AT1R) stimulation. Its counterpart angiotensin-(1-7) (Ang-(1-7)) induces vasodilation through stimulation of the Mas-receptor and subsequent release of nitric oxide (NO). We previously demonstrated that the effects of Ang-(1-7) and NO are diminished in kidneys of patients with atherosclerotic renal artery stenosis (ARAS). We hypothesized that the effects of both angiotensins are reduced in kidneys of patients with renal artery fibromuscular dysplasia (FMD) as well. Therefore, we studied in separate groups the effects of non-systemic doses of Ang II, Ang-(1-7), and AT1R-blocker eprosartan, on renal blood flow in kidneys with FMD and in kidneys without renovascular abnormalities. In addition, we assessed the responses to the NO-synthase-blocker L-NMMA.

Design and method: In 27 patients (off medication) with multifocal FMD of the right renal artery, we measured mean renal blood flow (MRBF) of the right kidney using 133Xenon washout before and during intrarenal infusion of Ang II (0.3 ng/kg/min, n=7), eprosartan (3 ug/kg/min, n=5), Ang-(1-7) (0.9 ng/kg/min, n=8), or L-NMMA (0.03 µg/kg bolus, n=13). Six patients underwent two infusion studies. Hypertensive patients without renovascular abnormalities, matched for dietary sodium intake, served as controls and were included in a 1:2 ratio.

Results: Baseline characteristics did not differ between groups. As compared to baseline, infusion of Ang II and L-NMMA resulted in a significant decrease in MRBF ($p<0.05$ vs. baseline). Infusion of Ang-(1-7) and eprosartan resulted in an increase in MRBF ($p<0.05$ vs. baseline). The magnitude of the effects was similar in kidneys with FMD and matched controls. Results from patients with bilateral FMD did not significantly differ from patients with unilateral FMD.

Conclusions: In kidneys with FMD the effects of Ang II, Ang-(1-7), eprosartan, and L-NMMA on MRBF are comparable to the effects in patients with essential hypertension. This suggests that in contrast to kidneys with ARAS, the activity of the renin-angiotensin system is not modified in FMD.

	FMD	Matched controls
Age (years)	52.5 ± 1.6	52.3 ± 1.8
eGFR (mL/min/1.73m²)	85 ± 3	80 ± 3
24h urinary sodium excretion (mmol)	99 ± 12	104 ± 8
24h ambulatory blood pressure (mean arterial pressure, mmHg)	114 ± 4	119 ± 3
Baseline MRBF	237 ± 80	231 ± 84
Delta MRBF Ang II	-73.5 ± 16.4	-96.6 ± 14.8
Delta MRBF eprosartan	+32.6 ± 8.6	+38.3 ± 17.0
Delta MRBF Ang-(1-7)	+21.6 ± 15.4	+29.1 ± 9.1
Delta MRBF L-NMMA	-59.8 ± 18.8	-53.6 ± 11.3

MRBF in mL/100g kidney/min. Data expressed as mean ± S.E.M.

PP.33.07 THE CHARACTERISTICS OF 24-H BLOOD PRESSURE PROFILE, 24-H ARTERIAL ELASTICITY AND PULSE WAVE REFLECTION IN HYPERTENSIVE PATIENTS WITH HYPERALDOSTERONISM

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Objective: To identify the relationship of 24-hour blood pressure profile, arterial elasticity and plasma aldosterone concentration (PAC) in arterial hypertension (AH).

Design and method: We studied two groups of patients with AH: 18 patients with high PAC and low plasma renin activity (PRA) (PAC>=120 pg/ml and PRA<= 1ng/ml/h) are included in Group 1 and 24 patients with normal PAC (PAC<120 pg/ml and PRA>1 pg/ml) were included in Group 2. PAC and PRA were performed by «IMMUNOTEC», FRANCE. The parameters of the 24-h blood pressure,arterial elasticity (24-h RWTT- Reflected Wave Transit Time) and pulse wave reflection (24-h augmentation index - AIx) were measured by validated ambulatory blood pressure monitoring system BPLab®. Data were represented as median (Med) and 25%-75% interquartile range (IQR). Mann-Whitney U test was used to compare the parameters in Group 1 and Group 2 and p-value <0,05 was considered as statistically significant.

Results: Group 1 aged 51 [39-57] years; male 44,4 %; PAC 270,1 [176,3-410,2] pg/ml; PRA 0,2 [0,1-0,4] ng/ml/h in comparison with Group 2 aged 52 [25-61] years, male 41,6%; PAC 65,4 [40-101,1]pg/ml, PRA 0,8 [0,5-1,2] ng/ml/h had no statistically significant difference between groups by age and sex, but had statistically higher the following parameters in Group 1:

	Group 1 (n=18) Med, IQR	Group 2 (n=24) Med, IQR	p-value for Mann-Whitney U test
24h DBP, mm Hg	91 [82;103]	81 [74;91]	0,01
daytime DBP, mm Hg	94 [84;103]	85 [78;93]	0,03
night time SBP, mm Hg	145 [135;161]	134 [122;143]	0,04
night time DBP, mm Hg	81 [77;99]	73 [65;80]	0,001
24h AIx,%	-1,5 [-20;-15]	-19 [-49;-7]	0,01
daytime AIx, %	-7 [-23;11]	-24 [-51;-7,5]	0,03
night time AIx,%	19 [-13;27]	-8[-42;3]	0,005

The statistically significant difference of 24-h RWTT and pulse pressure between groups were not obtained by using Mann-Whitney U test.

Conclusions: The results indicate more severe systolic and diastolic hypertension in low-renin hypertensive patients with hyperaldosteronism and increased arterial pulse wave reflection, measured by AIx. This may be due primarily to peripheral vasoconstriction rather than elasticity of the major arteries.

PP.33.08 A LITERATURE REVIEW OF THE NEW THERAPEUTIC APPROACHES IN THE MANAGEMENT OF HYPERTENSION, WHICH ARE ACTING ON THE RENIN-ANGIOTENSIN-ALDOSTERONE SYSTEM (RAAS)

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Objective: To outline the novel therapeutic approaches that could prove useful and more effective in the management of hypertension as well as improving the prognosis.

Design and method: Literature review.
Several medical databases were used to conduct scientific and literary searches; including Medline (via Ovid) and Scopus (Elsevier) which are easily accessible via the University of Liverpool and Leeds electronic libraries and PubMed. The resulting number of articles was massive, hence some limits were considered to ensure that only the relevant papers were included.

Results: Novel concepts in RAAS modulation.
Direct Renin inhibitors (DRI): Aliskiren was the first drug in this class to be approved for clinical use in hypertension, and it has been shown to modulate vascular diseases such as hypertension, atherosclerosis and diabetic nephropathy (1).
Vasopeptidase inhibitors: a new class of agents that inhibit the ACE and neutral endopeptidase (NEP), which prevents the angiotensin II-mediated vasoconstriction. One of the most studied Vasopeptidase inhibitors, omapatrilat, reduced blood pressure in several models of experimental hypertension(2).
Prorenin receptor (PRR) antagonists: a new component the renin angiotensin system was cloned in the last few years. PRR specifically binds renin and Prorenin (3). The specific blockade of PRR reduces the enzymatic activity and also prevents some angiotensin independent actions of renin (4).
Aldosterone synthase inhibitors (ASI): a promising new therapeutic option for management of hypertension and end-organ protection. Preclinical trials have given promising results and early clinical trials mostly indicate that the (ASI- LCI699) is a well-tolerated and effective blood pressure lowering drug(5).
The JAK-STAT system: current research has revealed that this pathway is essential in the hypertensive response to Angiotensin II infusion. JAK2 is a key player in the process. Hence inhibiting the effect of JAK2 pharmacologically may help controlling hypertension (6).

Conclusions: There are numerous treatment options that could be used to control the RAAS. Despite the advances in this field, hypertension remains poorly controlled in some cases. The new drugs seem to be promising, but a lot of research is required before their efficacy is proven.

PP.33.09 EXPRESSION OF (PRO)RENIN RECEPTOR IN HUMAN ADRENAL AND ADRENAL TUMORS: ITS ELEVATED EXPRESSION IN ALDOSTERONE-PRODUCING ADENOMAS

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Objective: Adrenal tumors, particularly aldosterone-producing adenomas (APAs), are one of the most common causes for secondary hypertension. Normal adrenal glands and adrenal tumors express biologically active peptides and their receptors, including adrenomedullins and endothelins. (Pro)renin receptor ((P)RR) is a specific receptor for renin and prorenin. The aim of the present study is to clarify expression of (P)RR in tumor tissues of adrenal tumors including APAs.

Design and method: Expression of (P)RR was studied in adrenal tumor tissues by immunohistochemistry, Western blot analysis and real-time RT-PCR.

Results: (P)RR was shown to express in normal adrenal glands and tumor tissues of adrenocortical tumors including APAs by immunohistochemistry. (P)RR immunoreactivity was observed in both adrenal cortex and medulla of attached non-neoplastic adrenal glands. Higher (P)RR immunostaining was observed in zona glomerulosa and zona reticularis than in zona fasciculata and adrenal medulla. Positive (P)RR immunostaining was observed in tumor tissues of adrenocortical tumors. The intensity of (P)RR immunostaining was greater in APAs than in cortisol-producing adenomas, non-functioning adenomas or adrenal cancers. Positive (P)RR immunostaining was not observed in pheochromocytomas. Western blot analysis confirmed expression of (P)RR protein in attached non-neoplastic adrenal tissues and adrenocortical tumors at the position of 35 kDa. The relative expression levels of (P)RR protein were higher in tumor tissues of APAs than in attached non-neoplastic adrenal tissues of APAs. Moreover, real-time RT-PCR showed that (P)RR mRNA levels were significantly higher in tumor tissues of APAs than in other adrenal tumors and attached non-neoplastic adrenal tissues.

Conclusions: The present study has shown for the first time expression of (P)RR in adrenal tumors. The finding on elevated expression of (P)RR in tumor tissues of APAs suggested the possibility that (P)RR may play some pathophysiological roles in APAs.

PP.33.10 RENIN IS EXPRESSED IN D407 HUMAN RETINAL CELLS

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Objective: The renin-angiotensin system (RAS) is well recognized by its role in the control of blood pressure. However, besides the systemic RAS, it has recently been described tissue-specific RAS, including in the retinal tissue. The RAS has been implicated in pathologies such as diabetic retinopathy, a debilitating consequence of diabetes and the leading cause of blindness among working-age adults. RAS-based approaches for treatment of retinal diseases typically make use of conventional RAS blockers. Alternatively, aliskiren, the first direct renin inhibitor approved for clinical use as an antihypertensive drug, might offer great advantage over classical RAS blockers since it inhibits the RAS at the beginning of the cascade. The aim of the present study is to better characterize the RAS in retinal cells and evaluate the effect of aliskiren treatment in these cells.

Design and method: D407 cells, a human retinal pigment epithelial cell line, were subjected to immunocytochemistry and immunoblotting techniques to assess the cellular localization and expression of renin. D407 cells were exposed to aliskiren (Selleck Chemicals) and, concentration– and time–dependent effects were evaluated upon cellular viability by means of the calcein-am assay.

Results: We found that renin is expressed in D407 cells and localizes in the cytoplasm of the cells. Treatment of D407 cells with aliskiren (concentrations up to 100 μM and 8h of exposure) did not affected the viability of the cells.

Conclusions: Our results permit to conclude that human retinal cells express renin and allow us to define safety aliskiren concentrations to be used in these

cells to inhibit the local RAS. As the RAS is increasingly recognized as a mediator of the pathologies of diabetes, aliskiren treatment might be important to be in future used in conditions where the RAS is deregulated such as in diabetic retinopathy.

PP.33.11 MINERALOCORTICOID RECEPTORS IN THE DORSAL HINDBRAIN PROMOTE THE DEVELOPMENT OF STRESS-INDUCED HYPERTENSION AND MODULATE CARDIOVASCULAR RESPONSES TO ACUTE STRESS

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Objective: To test the hypothesis that mineralocorticoid receptors (MR) in the dorsal hindbrain (DHB), including the Nucleus of the Solitary Tract (NTS) act to facilitate an increase in baseline blood pressure during chronic stress and enhance cardiovascular responses to stress in male Sprague-Dawley rats.

Design and method: Blood pressure was measured using radiotelemetry transmitters implanted under isolfluane anesthesia at least 2 weeks prior to data collection. Baseline data were collected for 1 week then all rats were given a continuous choice of water or 1.8% NaCl to drink. After another week, 3-4mg pellets made of cholesterol (Chol) or the MR antagonist spironolactone (SPL) were implanted on the surface of the DHB over the NTS. This technique has been used previously to chronically increase levels of steroid-based compounds to the DHB without physiologically significant diffusion to other brain regions or the periphery. Two weeks later, rats were subjected to chronic variable stress (CVS) for 2 weeks or remained unstressed (n=4-6/group). CVS involved exposing rats to 1-2 stressors/day from the following: insulin-induced hypoglycemia, restraint, novel cage environment, cold swim, room temperature swim and predator urine.

Results: During the baseline period blood pressure there was no significant between-group difference in blood pressure, with an overall average of 95±1 and 99±1 mmHg during the light(L) and dark(D) periods, respectively. During the last week, CVS significantly ($P<0.05$) increased baseline blood pressure in the Chol+stressed (Δ 8±2(L) and 9±3(D) mmHg) but not in the SPL+stressed rats (Δ 1±1 and 1±1 mmHg). Blood pressure was not changed in the unstressed Chol(Δ 1±2 mmHg and Δ 3±2) or SPL(Δ -1±1 and Δ 1±1 mmHg) rats. Novel cage stress increased arterial pressure during the 15 min of stress and in the 60 min post-stress recovery period. SPL attenuated the average arterial pressure response during the recover period (16±3 vs 6±1 mmHg in Chol vs. SPL rats). SPL did not alter the arterial pressure response to restraint, cold water or room temperature swim stressors.

Conclusions: Chronic blockade of DHB MR can eliminate stress-induced hypertension and attenuate the arterial pressure response to a novel cage stress.

PP.33.12 EFFECTS OF CHYMOSTATIN, A CHYMASE INHIBITOR, ON BLOOD PRESSURE AND KIDNEY HAEMODYNAMICS IN SPONTANEOUSLY HYPERTENSIVE RATS

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Objective: Chymase is known to form angiotensin II in cardiovascular and renal tissues independent of angiotensin converting enzyme (ACE), and its expression is increased in pathological conditions. Chymase inhibitors such chymostatin could be applied to inhibit the local renin-angiotensin systems (RAS) and prevent the development of hypertension and vascular damage. We examined how acute blockade of chymase would affect blood pressure and renal haemodynamic parameters in a genetic model of experimental hypertension in vivo.

Design and method: Male spontaneously hypertensive rats (SHR) in the development (age: 7 weeks) and established stage of hypertension (16 weeks) were used in acute experiments. Chymostatin or its solvent was infused intravenously at 2 mg/kg/h, for one hour, bracketed by control and recovery periods. Effects of chymostatin on mean blood pressure (MBP) and haemodynamic parameters of the kidney were recorded. The blood perfusion of the renal cortex (CBF), outer (OMBF) and inner medulla (IMBF) were measured using laser-Doppler Periflux system. Perfusion of the whole kidney (RBF) and of the hind limb (IBF) were measured using non-cannulating probes (Transonic system) placed on the left renal and the right iliac artery, respectively.

Results: Chymostatin affected blood pressure only in the established stage of genetic hypertension. 16-week SHR responded to chymase blockade with a decrease in MBP (145±7 vs 154±7 mmHg in control period; $p<0.05$) and in RBF (4.8±0.9 vs 5.6±0.9 ml/min in control period; $p<0.05$). Moreover, in SHR 16 chymase blockade prevented the decrease in IBF. Chymostatin improved RBF in SHR 7 while its solvent decreased it significantly. Effects of chymostatin infusion enhanced after discontinuation of the infusion.

Conclusions: The MBP decrease was observed in SHR 16, which suggests an important functional role of the ACE-independent pathway of the tissue RAS in the established stage of genetically determined hypertension. The decrease in MBP is probably responsible for the observed decrease in RBF. Chymostatin did not affect blood pressure in SHR 7. However, chymase blockade in younger SHR helps maintain RBF and, possibly, chronic chymase inhibition could attenuate the development of hypertension in older SHR.

PP.33.13 ANGIOTENSIN II UPREGULATE CYTOCHROME P-450 4A EXPRESSION IN RAT KIDNEY THROUGH ANGIOTENSIN II TYPE 1 RECEPTOR

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Objective: 20-hydroxyeicosatetraenoic acids (20-HETE) which is the major metabolites of arachidonic acid catalyzed by cytochrome P-450 (CYP) 4A isoforms, is an important substance for the regulation of vascular tone and renal tubular function. Previous studies showed that angiotensin II (Ang II) stimulated the renal CYP activity and 20-HETE production in preglomerular arteries and renal tubules. However, the regulation of CYP4A expressions by Ang II in kidney and mechanism are still not fully clarified.

Design and method: Male Sprague-Dawley rats were treated with vehicle, Ang II at low dose (AL, 0.17mg/kg/min, sc) and high dose (AH, 0.70mg/kg/day, sc) with or without candesartan (angiotensin II type 1 (AT1) receptor antagonist, 1mg/kg/day in drinking water) for 7 days. Systolic blood pressure (SBP) was measured by tail-cuff method. The CYP4A1, 4A2, and 4A8 protein expressions in kidney sections and liver were examined by immunoblot analysis with specific antibodies.

Results: The CYP4A1, 4A2, and 4A8 proteins were highly expressed in the renal cortex, lowly expressed in the outer medulla, but barely detectable in the inner medulla. The CYP4A1 and 4A2 proteins were highly expressed in the liver. Ang II treatment significantly increased SBP in AH group, but not in AL group (control, 110±2; AL, 114±5; AH, 171±11 mmHg), and candesartan treatment suppressed the Ang II-increased SBP. Ang II treatment dose-dependently increased the all CYP4A isoform expressions in the renal cortex and outer medulla, (CYP4A1, 26% and 222%; CYP4A2, by 50% and 258%; CYP4A8, by 73% and 686%). Ang II treatment significantly increased CYP4A2 expressions in the liver of AL group, but not in the liver of AH group. Candesartan treatment alone did not affect the CYP4A expressions and suppressed the Ang II-increased CYP4A expressions.

Conclusions: Ang II treatment increases CYP4A isoform expressions in the kidney through AT1 receptor. The Ang II-upregulated CYP4A expressions may play an important role in renal function and hypertension.

PP.33.14 LEVELS OF SOLUBLE PRORENIN RECEPTOR IN URINE ARE DISSOCIATED FROM THOSE IN PLASMA IN PATIENTS WITH INTRARENAL RAS ACTIVATION

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Objective: The prorenin receptor (PRR) activates prorenin and its binding to prorenin stimulates transforming growth factor-beta (TGF-β) expression. PRR expresses a soluble form (sPRR), which is found in plasma and urine and also binds renin and prorenin. An association between plasma sPRR and increased risk of chronic kidney disease has been suggested; however, recent evidence indicates that acute and chronic changes in the degree of renin-angiotensin system (RAS) activation do not influence plasma sPRR. Because a dissociation between systemic and intrarenal RAS has been proposed, here we examined whether sPRR in urine varies in patients with intrarenal RAS activation.

Design and method: A cross sectional pilot study was performed to measure plasma and urine sPRR levels, along with contents of prorenin (PPrC and UPrC), renin (PRC and URC), and urinary TGF-β in 251 subjects, including healthy subjects (Ct; n=108), and patients with type-2 diabetes (DM; n=28), hypertension (HTN; n=47), and DM+HTN (n=68). Urine albumin (uAlb) and creatinine (uCr) were also assessed.

Results: Compared to controls, DM and DM+HTN patients showed higher PRC (DM: 20.7±2; DM+HTN: 20.8±1 vs. Ct: 6.6±1 ng AngI/mL/hr; p<0.01) and even greater of URC (DM: 166.1±46; DM+HTN: 164.1±47 vs. Ct: 24.9±10 ng AngI/mL/hr; p<0.001). URC was positively associated with uAlb/uCr (p<0.05). PPrC was elevated in DM patients, but UPrC was no different among groups. Although plasma sPRR did not differ among patients with DM, HTN, and DM+HTN compared to Ct subjects; its concentrations in urine were ~65% and ~35% lower in DM and DM+HTN patients. RAS blockade increased plasma sPRR (~20-25%) but not in urine. TGF-β in urine was increased in DM and DM+HTN but not in HTN patients (DM: 22±5; DM+HTN: 26±7; HTN: 12±6 vs. Ct: 5.6±2 pg/mg uCr).In contrast to plasma sPRR, its levels in urine were inversely correlated with URC in DM and DM+HTN patients.

Conclusions: These data suggest that full-length PRR, but not the soluble form, might be responsible for increasing renin activity in urine of diabetic patients and for a greater risk of diabetic nephropathy, as reflected by the augmentation of TGF-β in urine.

PP.33.15 A NOVEL APPROACH FOR THE PATIENT SPECIFIC CHARACTERIZATION OF THE HUMAN SYSTEMIC RENIN-ANGIOTENSIN-SYSTEM: PROOF-OF-CONCEPT IN HEALTHY VOLUNTEERS RECEIVING RAS-BLOCKER TREATMENT

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Objective: The measurement of angiotensin concentrations in clinical samples represents a challenging task for the investigator. Angiotensin concentrations are affected by multiple molecular components including receptors and enzymes which might be either dissolved in plasma or attached to blood cells or endothelial surfaces throughout the body, giving rise to a concentration determining local enzymatic environment. This environment substantially changes during blood collection leading to a rapid and fundamental shift in angiotensin peptide levels. Therefore, a clearly defined and properly controlled sample stabilization procedure is essential for the accurate measurement of in vivo angiotensin peptide levels, which might be difficult to be achieved in the clinical setting, leading to a huge variability in measurement results when comparing different studies. We present a novel method for the biochemical characterization of the human RAS (ex vivo RAS-Fingerprint) that is compatible with standard clinical samples.

Design and method: 12 healthy volunteers were treated with three different classes of RAS blockers (ARB, ACE-Inhibitor, Renin-Inhibitor) for a period of 8 days in a 3-week interval. Samples were collected at different time points on day 1 and day 8 of treatment. The pharmacologic impact of different RAS blockers was analyzed by measuring and comparing circulating (in vivo) and ex vivo levels of 10 angiotensin metabolites by mass spectrometry.

Results: The mass spectrometry based measurement of in vivo and ex vivo angiotensin metabolite levels revealed patient specific features in the response to different RAS blocker treatments. Different RAS blockers resulted in selectively affected angiotensin metabolite patterns and induced distinct and patient specific compensatory mechanisms that could significantly affect the therapeutic outcome.

Conclusions: The novel assay is compatible with undiluted heparin plasma, serum and whole blood and can be further applied to long-term stored frozen plasma and serum samples, allowing the retrospective analysis of clinical samples. The utilization of ex vivo RAS-Fingerprinting in clinical studies will substantially enhance our understanding of the human RAS and could lead to the development of personalized approaches for the treatment and prevention of cardiovascular diseases in the future.

PP.33.16 SALT INTAKE DOEN'T INFLUENCE ON THE CONTROL OF BLOOD PRESSURE IN TREATED HYPERTENSION

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Objective: High salt intake was conceptually known to increase body volume and then decrease renin-angiotensin-aldosterone system (RAS). This can be translated to possibly fewer effects of RAS blockers on blood pressure reduction in patients with high salt intake, particularly in Asians, but it has not been clearly demonstrated so far.

Design and method: This study investigates the influence of RAS blocker on blood pressure control and the target organ damage according to salt intake. Subjects are selected in the treated hypertensive patients who have under single drug in K-MetS study.

Results: Subjects were 1962 patients (male 51%, mean age 57.6±10.6 years) and classified 4 groups; A, angiotensin receptor blocker or angiotensin converting enzyme inhibitor; B, beta-blocker; C, calcium channel blocker; D, diuretic. Clinic and home blood pressure (BP) were measured and salt intake was estimated by spot urine sodium corrected by creatinine. As markers of target organ damage, spot urine proteinuria. Drug effects were estimated by morning/evening BP ratio of more than 5-day home BP measurement. Average BP in clinic (142.3±16.9/87.2±11.0 mmHg) and at home was without difference among 4 groups. Urinary salt excretion (urinary sodium/creatinine ratio or sodium/potassium ratio) were similar in 4 groups (p=0.997). Proteinuria and microalbuminuria were similar in 4 groups. Drug effects measured by M/E SBP ratio was 1.01±0.07, 1.01±0.06, 1.01±0.06 and 1.00±0.05 in A, B, C and D groups, respectively without statistically significant difference. In the multivariate analysis, salt intake (urinary sodium/creatinine ratio) and drug effects (M/E SBP ratio) were similar after controlling age, sex, and body mass index.

Conclusions: Results indicate no association of drug class effects on BP control according to salt intake in the treated hypertensive patients. Prospective studies are needed to confirm this observational result.

PP.33.17 ANGIOTENSIN II TYPE 2 RECEPTOR INTERACTING PROTEIN INHIBITS VASCULAR REMODELING WITH ACTIVATION OF PEROXISOME PROLIFERATOR-ACTIVATED RECEPTOR GAMMA

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Objective: Angiotensin II type 2 (AT2) receptor and AT2 receptor interacting protein (ATIP), which specifically binds with C-terminal of AT2 receptor, plays a crucial role in vascular remodeling. Recently, we reported that direct AT2 receptor stimulation accompanied with peroxisome proliferator-activated receptor gamma (PPARγ) activation ameliorated insulin resistance in type 2 diabetic mice. Accordingly, this study is aimed to investigate the vascular protective effect of AT2 receptor and ATIP with activation of PPARγ activation, and its mechanism in cultured vascular smooth muscle cells (VSMCs).

Design and method: Vascular injury was induced by polyethylene-cuff placement around the femoral artery in C57BL/6J mouse. Some mice were treated with compound 21 (C21), AT2 receptor agonist, and/or, GW9662, a PPARγ antagonist. VSMCs were isolated form aorta of smAT2 transgenic mice (smAT2-Tg), which highly express AT2 receptor. PPARγ activity was measured by dual-luciferase assay, and electrophoresis mobility shift assay (EMSA) was performed using nuclear extract prepared from VSMCs of smAT2-Tg.

Results: Treatment with C21 attenuated neointimal formation, VSMC proliferation and the increases in mRNA levels of monocyte chemoattractant protein-1, tumor necrosis factor-α and interleukin-1β in the injured artery, whereas these inhibitory effects of C21 were blunted by co-treatment with GW9662. Dual-luciferase reporter assay showed that treatment with C21 of smAT2-Tg VSMCs increased PPARγ activity in a dose-dependent manner. We further examined the DNA-binding activity of PPARγ by EMSA using nuclear extract prepared from C21 treated smAT2-Tg VSMCs and observed that DNA-binding activity of PPARγ started to increase 15 minutes after C21 stimulation. Interestingly, we observed that ATIP was involved in the PPARγ complex formation in VSMCs in addition to RXRα or p300, which was evaluated by EMSA, and that transfection of siRNA of ATIP attenuated AT2 receptor-mediated increase in PPARγ activity in VSMCs. In response to AT2 receptor stimulation, ATIP was translocated from plasma membrane to nucleus.

Conclusions: Our results suggest a new mechanism that AT2 receptor stimulation activates PPARγ, thereby resulting in amelioration of vascular remodeling and ATIP plays an important role in AT2 receptor-mediated PPARγ activation.

PP.33.18 ADIPOSE MINERALOCORTICOID RECEPTOR ACTIVATION REGULATES PRO- AND ANTI-INFLAMMATORY ADIPOKINE EXPRESSION IN OBESITY RELATED TYPE 2 DIABETES

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Objective: Adipose tissue (AT), an active endocrine organ, produces many factors including aldosterone (aldo), as we recently reported. Aldo plays an important role in cardiovascular disease, including obesity and diabetes. Plasma levels of aldo are positively correlated with obesity, and adipocytes from diabetic obese mice produce higher levels of aldo versus controls. Mechanisms whether adipocytes aldo/mineralocorticoid receptor (MR) system activation plays a role in the pathogenesis of diabetes-associated cardiovascular complications remains elusive. We hypothesize that adipose MR modulate pro- (leptin, IL-6, MCP1) and anti-inflammatory (adiponectin) adipokine expression and release, leading to insulin resistance.

Design and method: We evaluated the role of adipose MR on adipokine expression in obesity related to type 2 diabetes, using two mouse models: 1) db/db obese mice treated for 4 weeks with K canrenoate (MR antagonist, 30 mg/kg/day) and 2) mice in which MR is selectively overexpressed in adipocytes (AMROE). Perivascular adipose tissue and mature adipocytes were used to evaluate adipokine expression, MR system, Rho kinase and insulin signaling by qPCR and western blotting.

Results: In mature adipocytes from db/db mice vs db/+ mice, mRNA levels of MR (1.8 fold) and markers of MR activation (Sgk1 and Ngal- 2.3 and 2.9 fold) were increased. Adiponectin mRNA levels were decreased (2.6 fold; $p<0.01$), whereas leptin and IL-6 mRNA levels were increased (2 and 4.8 fold; $p<0.01$); effects blocked by K canrenoate. Moreover, db/db mice presented decreased IRS1 and increased CD36 mRNA levels, features of insulin resistance. These were prevented by MR antagonist. In white AT and mature adipocytes from AMROE mice, leptin, IL-6, MCP1 mRNA levels were increased (Ctr vs AMROE: 1.1±0.2 vs 4.1±1.1, 2.4±0.1 vs 6.4±0.8, 1.2±0.1 vs 6.1±1.8, respectively; $p<0.05$) and adiponectin mRNA levels were decreased by 50% ($p<0.05$). Opposite effects were found in brown AT, where decreased pro- and increased anti-inflammatory adipokines mRNA levels were observed.

Conclusions: These findings suggest that in db/db mice where activation of aldo/MR signaling is increased, there is an imbalance in the expression of pro- and anti-inflammatory adipokines. Our results implicate a potential role of adipocyte aldo/MR in adipokine dysregulation during obesity/diabetes, elucidating novel mechanisms.

PP.33.19 PLEIOTROPIC EFFECTS OF ANGIOTENSIN II RECEPTOR BLOCKER VALSARTAN IN PATIENTS WITH ARTERIAL HYPERTENSION AND CHRONIC OBSTRUCTIVE PULMONARY DISEASE

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Objective: To assess effects and safety of using angiotensin II receptor blocker valsartan in patients with arterial hypertension (AH) and chronic obstructive pulmonary disease (COPD).

Design and method: 80 patients men (age 60.4±2.6 years) with AH 1-2 degree and COPD II-IV stages (Global Initiative for Chronic Obstructive Lung Disease, 2011) in remission were treated by valsartan during 24 weeks. Patients received basic therapy: combination of anticholinergic agents (ipratropium bromide, tiotropium bromide) with beta-2-adrenomimetic fenoterol. All subjects underwent a 24-h ambulatory blood pressure monitoring (ABPM) before the treatment, on the fourth week and after the treatment valsartan. After ABPM on the fourth week, we increased the dose of valsartan to 160 mg/day to half of the patients. Safety criteria were spirometry, daily pulsoxymetria. We analyzed the level of C-reactive protein (CRP), VCAM-1 (vascular cell adhesion molecule 1), endothelin-1 before and after the treatment period.

Results: There was a 20.1% decrease of 24-h systolic blood pressure (SBP), a 10.7% decrease of 24-h diastolic blood pressure (DBP), a 17.6% decrease of day SBP, a 15.8% decrease of day DBP, a 22.3% decrease of night SBP, a 15.6% decrease of night DBP in patients with arterial hypertension and COPD ($p< 0.001$). A daily profile of blood pressure was improved. Endothelin-1 decreased from 0.36 (0.27; 1.03) to 0.24 (0.17; 0.88) fmol/ml ($p<0.05$). CRP decreased from 3.35 (2.80; 6.4) to 2.9 (1.33; 4.3) mg/l ($p<0.05$). VCAM-1- marker of endothelial dysfunction decreased from 980 (780; 1100) ng/ml to 740 (600; 940) ng/ml ($p<0.001$). Serum uric acid decreased (12%, $p<0.001$). Valsartan did not influence the airflow limitation and saturation.

Conclusions: Angiotensin II receptor blocker valsartan demonstrated good blood pressure lowering effect and safety for patients with AH and COPD. Valsartan decreased the level of uric acid in patients with AH and COPD. There were found the pleiotropic effects of valsartan to improve endothelial function and chronic systemic inflammation. It is important because chronic low-grade systemic inflammatory and endothelia dysfunction are basic mechanisms of vascular impairments and development of cardiovascular diseases in patients with COPD.

PP.33.20 RENOPROTECTIVE EFFECT OF ALISKIREN COMBINED WITH AN ANGIOTENSIN II RECEPTOR BLOCKER IN HYPERTENSIVE PATIENTS: RESULTS FROM THE ALEA STUDY

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Objective: The ALEA study showed comparable effect of aliskiren and trichlormethiazide in addition to valsartan on lowering central aortic blood pressure in hypertensive patients. In this sub-study, we compared the effects of aliskiren/valsartan and trichlormethiazide/valsartan on microalbuminuria and oxidative stress in hypertensive patients.

Design and method: The ALEA study was a 24-week, prospective, multicenter, randomized, open-label study. Inclusion criteria were hypertensive patients with a clinic BP >140 mmHg and/or 90 mmHg and already being treated with valsartan only. We administered aliskiren (150-300 mg/day) to 52 patients or triochlorothiazide (0.5-2 mg/day) to 51 patients in addition to the valsartan (80 mg/day) and followed for 24 weeks. This sub-study examined changes in urine albumin-to-creatinine ratio (UACR) and urinary 8-Hydroxydeoxyguanosine (8-OHdG).

Results: In both groups, brachial systolic blood pressure were significantly decreased 24 weeks later similarly ($p=0.94$). The reduction in central blood pressure also similar between the two groups ($p=0.52$). Baseline value of UACR were comparable between the two groups; however, UACR after 24 weeks treatment was significantly lower in the aliskiren/valsartan group than in the trichlormethiazide/valsartan group (the between-group difference at 24 weeks was 7.5 mg/g Cr; 95% CI: 0.93 to 14.0 mg/g Cr; $p=0.02$). Baseline levels of 8-OHdG were comparable between the two groups; however, 8-OHdG levels after 24 weeks treatment was significantly lower in the aliskiren/valsartan group than in the trichlormethiazide/valsartan group (the between-group difference at 24 weeks was 2.0 ng/g Cr; 95% CI: 0.46 to 3.57 ng/g Cr; $p=0.01$).

Conclusions: The combination of aliskiren/valsartan significantly reduced UACR and 8-OHdG compared to trichlormethiazide/valsartan, suggesting that dual block of renin-angiotensin system by direct renin inhibitor and angiotensin II receptor blocker showed renoprotective effect through ameliorating oxidative effect.

PP.33.21 EFFECTS OF ALISKIREN OR A DIURETIC IN COMBINATION WITH AN ANGIOTENSIN II RECEPTOR BLOCKER ON LOWERING CENTRAL AORTIC PRESSURE IN HYPERTENSIVE PATIENTS (ALEA STUDY)

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Objective: We compared the effects of a direct rennin inhibitor and a diuretic in combination with an angiotensin II receptor blocker on lowering central aortic blood pressure and augmentation index in hypertensive patients.

Design and method: The ALEA study was a 24-week, prospective, multicenter, randomized, open-label study. Inclusion criteria were hypertensive patients with a clinic BP >140 mm Hg and/or 90 mm Hg and already being treated with valsartan (80mg/day) alone. A total of 103 patients were enrolled from 15 institutions from Jun 2012 to March 2013. We administered aliskiren (150-300 mg/day) to 52 patients or trichlormethiazide (0.5-2 mg/day) to 51 patients in addition to the valsartan and followed for 24 weeks (Mean age, 68 years and 43% of men). Radial augmentation index (AI) and central BP were measured by radial artery tonometory (HEM9000AI, Omron, Japan). The primary outcome measure was changes in central aortic blood pressure and radial AI from baseline to the end of follow-up.

Results: 48 patinets in the aliskiren/valsartan group and 47 patinets in the trichlormethiazide/valsartan group completed this study finally. In both groups, brachial systolic blood pressure were significantly decreased 24 weeks later, and the difference in the reduction in brachial systolic blood pressure between the groups was not significant (the between-group difference at 24 weeeks was -0.27 mm Hg; 95% CI: -7.5 to 7.0 mm Hg; p=0.94). After adjustment for baseline covariates (age, gender, and diabetes), the reduction in radial AI in the aliskiren/valsartan group was similar to that in the trichlormethiazide/valsartan group (the between-group difference at 24 weeeks was 2.4%; 95% CI: -2.2 to 7.0 %; p=0.30). The reduction in central blood pressure in the aliskiren/valsartan group was also similar to that in the trichlormethiazide/valsartan group (the between-group difference at 24 weeks was 2.9 mm Hg; 95% CI: -6.2 to 12.2 mmHg; p=0.52).

Conclusions: The combination of valsartan and a direct renin inhibitor , aliskiren, had a comparable effect on lowering central aortic blood pressure and radial AI to the combination of valsartan and a diuretic.

PP.33.22 DIURETIC EFFECT OF ARB IS NOT ATTRIBUTABLE TO BP LOWERING DURING PREVIOUS NIGHT, BUT TO INHIBITION OF TUBULAR SODIUM REABSORPTION

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Objective: We have reported that the angiotensin receptor blocker(ARB), Olmesartan can increase the daytime natriuresis to attain a lower sodium balance, and can restore the non-dipper circadian blood pressure (BP) rhythm at the chronic treatment phase (8 wk). However, the increase in daytime natriuresis can be explained by the two mechanisms 1) ARB can inhibit the fractional reabsorption of sodium similar to diuretics; and 2) ARB can lower night-time BP resulting in attenuation of the night-time natriuresis, and thus the daytime natriuresis compensatory increase. If the latter holds, the decrease in the night-time BP can precede the increase in daytime natriuresis during the acute phase of treatment (not steady state).

Design and method: We studied whether an increase in daytime natriuresis, or a decrease in night-time BP occurs first within 2 days after the start of ARB (acute phase), in eight CKD patients with hypertension (six men, two women, 56 (44-68) years old, GFR 56 (19-76) ml/min/1.73m²).

Results: At baseline, three out of the eight patients exhibited dipper circadian BP rhythm, and five had non-dipper BP rhythm. The three dippers at baseline exhibited an increase in daytime natriuresis within two days after starting ARB. One of the five non-dippers demonstrated an increase in natriuresis on the first day of treatment and the rhythm was restored into dipper pattern on the same day. Other four non-dipper patients at baseline remained as the non-dippers in the first 2 days after the institution of treatment. However, all of these four patients demonstrated the increase in daytime natriuresis within 2 days after starting treatment (1 day for three patients; 2 days for one patient) even though circadian BP rhythm was not restored.

Conclusions: Our study demonstrated that the ARB could increase daytime natriuresis in the absence of the restoration of the circadian BP rhythm at the acute phase of the treatment, indicating that the increase in daytime natriuresis is not attributable to the BP reduction during the previous night. Further study is needed to investigate whether ARBs can restore the non-dipper BP rhythm in patients with activated intrarenal renin-angiotensin system.

PP.33.23 ROLE OF ANGIOTENSIN II RECEPTOR SUBTYPES IN REGULATING ASTROCYTE SENESCENCE

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Objective: The renin-angiotensin-system is known to play some role in the central nervous system (CNS), however, its role in senescence is not well examined. Recent evidence demonstrated that defects in astrocyte function, such as accumulation of senescent astrocytes is associated with age-related neuronal degeneration and cognitive decline. We previously reported that angiotensin II stimulated vascular smooth muscle cell (VSMC) senescence via angiotensin type 1 (AT1) receptor-mediated oxidative stress/cycling-dependent kinase inhibitor (CDKI) signaling pathway, and inhibited VSMC senescence via angiotensin II type 2 (AT2) receptor-mediated methyl methanesulfonate sensitive 2 / DNA repair signaling mechanism. Therefore, we examined the potential roles of angiotensin II receptor subtypes in regulating astrocyte senescence.

Design and method: Astrocytes prepared from the neonate of wide-type (WT) mice (day 0-2 after birth) and AT2 receptor knockout (AT2KO) mice were persistently stimulated with angiotensin II with medium change every day. Cellular senescence was evaluated by senescence-associated β-galactosidase (SA-β-gal) activity. Signaling molecules were investigated by Western blot analysis.

Results: Persistent angiotensin II treatment increased SA-β-gal activity, p53 and CDKI expression, such as p21, p27 and p16 in time-dependent manner; these effects of angiotensin II were further enhanced in astrocytes prepared from AT2KO mice. Angiotensin II-induced SA-β-gal activity and CDKI expression were inhibited by an AT1 receptor blocker, azilsartan, whereas these inhibitory effects of azilsartan were weaker in AT2KO astrocytes than in WT astrocytes. Administration of an AT2 receptor agonist, C21, decreased SA-β-gal activity and CDKI expression in WT astrocytes, but not in AT2KO astrocytes. Moreover, C21 treatment further enforced the inhibitory effects of azilsartan on angiotensin II-induced SA-β-gal activity and CDKI expression in WT astrocytes.

Conclusions: Angiotensin II promoted astrocyte senescence via AT1 receptor-mediated signaling pathway. On the other hand, direct AT2 receptor stimulation exerted inhibitory effect on AT1 receptor-induced astrocyte senescence. AT1 receptor blockers and direct AT2 receptor stimulation might be useful for the treatment of CNS diseases associated with astrocyte senescence.

PP.33.24 COMPARISON OF INHIBITORY EFFECTS BETWEEN FIMASARTAN AND ENALAPRIL ON CATECHOLAMINE SECRETION FROM ADRENAL MEDULLA

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Objective: The present study was attempted to compare enalapril, an angiotensin converting enzyme inhibitor (ACEI) with fimasartan, an angiotensin II receptor blocker (ARB) in the inhibitory effects on the secretion of catecholamines (CA) from the perfused model of the rat adrenal gland.

Design and method: The adrenal gland was isolated and perfused with Krebs-bicarbonate. CA was measured directly by using the fluorospectrophotometer.

Results: Both enalapril (50 μM) and fimasartan (50 μM) during perfusion into an adrenal vein for 90 min inhibited the CA secretory responses evoked by ACh (5.32 mM), DMPP (a selective neuronal nicotinic Nn receptor agonist, 100 μM), high K+ (a direct membrane-depolarizer, 56 mM), and McN-A-343 (a selective muscarinic M1 receptor agonist, 100 μM) in a time-dependent manner. Also, in the presence of enalapril or fimasartan, the secretory responses of CA evoked by veratridine (an activator of voltage-dependent Na+ channels, 100 μM), Bay-K-8644 (a L-type dihydropyridine Ca2+ channel activator, 10 μM), and cyclopiazonic acid (a cytoplasmic Ca2+-ATPase inhibitor, 10 μM) were significantly reduced. Based on the same concentration (50 μM) of enalapril and fimasartan, for the CA release evoked by Ach, high K+, DMPP, McN-A-343, angiotensin II, veratridine, Bay-K-8644 and cyclopiazonic acid, the following rank order of inhibitory potency was obtained: fimasartan> enalapril. In the simultaneous presence of enalapril and fimasartan, Ach-evoked CA secretory responses were more strongly inhibited in comparison with that of enalapril- or fimasartan-treated alone.

Conclusions: Taken together, these results show that both enalapril and fimasartan inhibit the CA secretory responses evoked by activation of both cholinergic and angiotensin II receptors stimulation as well as by direct membrane depolarization in the perfused model of the isolated rat adrenal medulla. When these two drugs were used in combination, their effects were enhanced, which may also be of clinical benefit. Based on concentration, both drugs also appear to act by

blocking local modulation of CA release by the chromaffin cells. Conclusively, it seems that fimasartan (ARB) elicits more powerful potency in the inhibitory effect on the adrenal CA secretion than enalapril (ACEI).

PP.33.25 INCREASE IN VASCULAR INJURY OF SODIUM OVERLOADED MICE MAY BE RELATED TO VASCULAR ANGIOTENSIN MODULATION

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Objective: To study the effect of chronic sodium overload upon femoral injury, and its relation to vascular angiotensin modulation.

Design and method: Male C57Bl mice were divided into 3 groups: control (cont, n=7), receiving 1% NaCl solution for 2 weeks (salt-2, n=8) or 12 weeks (salt-12, n=9). Two-weeks before end of study, was implanted 2mm catheter around left femoral artery to induce injury (right artery was maintained as control). Body weight was measured at weeks 4, 6, 8, 10 and 12, and at the end of the study were also measured pulse blood pressure (BP) and heart rate (HR) by tail plethysmography. The arteries were collected, prepared for histological analysis, and sections were stained by Verhoeff-Van Gieson for analysis of arterial thickening and by picrosirius for analysis of perivascular collagen deposition. Angiotensin II, and(1-7) were quantified in fresh arteries by using HPLC method. The results were compared by ANOVA, using p≤0.05 as significant.

Results: At the end of experiment, we did not observe differences in body weight, BP and HR. Intima/media ratio increased similarly in injured femoral arteries of cont (22.7±5%) and salt-2 mice (18.6±7%), but showed an important increase in salt-12 mice (31.1±6%). On the other hand, sodium overload modified perivascular collagen deposition, increasing thick fibers (cont:0.5%; salt-2:3.4%; salt-12:0.6%) and decreasing thin fibers (cont:7.4%; salt-2:0.5%; salt-12:6.8%) after two weeks in non-injured arteries. Injured arteries presented similar collagen fibers distribution. Angiotensin quantification showed an increase of ang(1-7) in salt treated mice (salt-2:+72%; salt-12:+45%) with a concomitant decrease of Ang II (salt-2:-54%; salt-12:-60%). Vascular injury determined an important increase in ang(1-7) of salt-12 mice (+80%), maintaining ang II reduction similar to non-injured artery.

Conclusions: The lack of changes in BP and HR suggest that structural changes observed are due to non-hemodynamic mechanisms. Collagen evaluation suggest that sodium overload induces time-related changes in vascular remodeling. The increase of artery injury with concomitant increase of ang(1-7) in 12-weeks treated mice shows a direct relation between time of salt treatment and magnitude of vascular injury. These results also suggest that ang(1-7) may be related to magnitude of vascular injury.

PP.33.26 CYTOKINES ACTIVITY AND COMPONENTS OF THE RENIN-ANGIOTENSIN SYSTEM AT PATIENTS WITH ARTERIAL HYPERTENSION AND DISORDERS OF CARBOHYDRATE METABOLISM

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Objective: The purpose of our research was to study features of activation of the pro-inflammatory cytokine - interleukin - 18 (IL- 18) and anti-inflammatory cytokine - interleukin - 10 (IL-10), I/D gene ACE polymorphism at patients with arterial hypertension and disorders of carbohydrate metabolism.

Design and method: 103 hypertensive patients by clinical, anthropometric methods were examined, which have been divided into 3 groups depending on glycaemic profile: 1st group- 60 patients without carbohydrates metabolism disorders, the 2nd group – 39 patients with prediabetes, the 3rd group – 30 patients with diabetes mellitus 2 type (DM 2 type). IL-18 and IL-10 by ELISA were determined. Plasma fasting levels of glucose, insulin, HbA1c were measured, HOMA was calculated. I/D gene ACE polymorphism were determined by PCR.

Results: When studying I/D gene ACE polymorphism in all studied groups prevalence of adverse genotypes of ID and DD was established. In the 1st group ID genotype – 23 patients (38.33%), DD genotype – 25 patients (41.67%); in the 2nd group - ID genotype – 21 patients (53.85%), DD genotype – 12 patients (30.77%); in the 3rd group - ID genotype – 16 patients (53.33%), DD genotype – 10 patients (33.33%). Also, at patients of 1st and 2nd groups statistically significant elevation of anti-inflammatory IL-10 levels (90.2 (71.2-97.5) pg/ml; 90.8 (88.1-94.4) pg/ml, $p<0.05$) was detected respectively in comparison with the 3rd group of patients with DM 2 type associated hypertension (77.4 (71.0-97.0) pg/ml) against elevation of pro-inflammatory IL-18 levels in all three groups (176.5 (125.0-205.0) pg/ml; 177.0 (170.0-205.0) pg/ml; 170.0 (125.0 – 210.0) pg/ml).

Conclusions: Obtained results allow assuming that patients with arterial hypertension presence of ID and DD genotypes of I/D gene ACE polymorphism can be associated with disorders of carbohydrate metabolism. Increase of anti-inflammatory IL-10 levels at patients with arterial hypertension accompanied by prediabetes is probably of compensatory character, and can have important diagnostic value in prevention of further development of DM 2 type which was characterized by significant decrease of anti-inflammatory marker and by shift towards pro-inflammation activation.

PP.33.27 ANGIOTENSIN-(1-7) AND ITS RELATIONSHIP WITH METABOLIC AND LIFESTYLE RISK FACTORS

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Objective: Angiotensin-(1-7) acts via its binding with the MAS-receptor by exerting depressor, vasodilator, and antihypertensive actions. We aimed to explore angiotensin-(1-7) and its associations with metabolic (lipids and glucose) and lifestyle risk factors (cotinine and gamma glutamyltransferase as measures of smoking and alcohol use, respectively) in a bi-ethnic South African sample stratified by a marker of cardiac overload.

Design and method: A bi-ethnic sample of 59 apparently healthy men was paired by age and body mass index. Angiotensin-(1-7) levels were determined by renin-angiotensin system fingerprint quantification methods. Haemodynamic and standard metabolic measures were determined along with N-terminal pro B-type natriuretic peptide (NT-proBNP) levels measured by a sandwich immunoassay.

Results: No interaction with ethnicity on the association between angiotensin-(1-7) and NT-proBNP ($F(59)=0.68$; $p=0.58$) was found. The cohort was then stratified by a median (13.8 ng/l) split of NT-proBNP levels. Arterial compliance ($p=0.016$) and renal creatinine clearance ($p=0.028$) were lower in the higher NT-proBNP group. Mean values of all other haemodynamic, metabolic and lifestyle measures were similar between the two groups. Angiotensin-(1-7) independently associated with gamma glutamyltransferase in men with low NT-proBNP (adj. $R2=0.74$; $\beta=-0.40$; $p=0.008$), whereas associations with low density lipoprotein cholesterol ($\beta=0.38$; $p<0.0001$), glucose ($\beta=-0.23$; $p=0.015$), cotinine ($\beta=-0.25$; $p=0.008$) and gamma glutamyltransferase ($\beta=-0.31$; $p<0.0001$) were evident in the higher NT-proBNP group (adj. $R2=0.87$). These associations were independent of age, body mass index, ethnicity, arterial compliance and estimated creatinine clearance.

Conclusions: This study included healthy men with lower and higher means of NT-proBNP levels. Our results show that in men with higher NT-proBNP levels, angiotensin-(1-7) levels may decrease in the presence of the smoking (cotinine), alcohol use (gamma glutamyltransferase) and elevated blood glucose levels. Therefore, men presented with adverse metabolic and lifestyle risk factors, in combination with subclinical elevated levels of NT-proBNP, are at higher risk to lose the protective cardiovascular effects of angiotensin-(1-7).

PP.33.28 ANGIOTENSIN CONVERTING ENZYME (ACE)-INHIBITION IN HEART TRANSPLANT PATIENTS: LOCAL AND SYSTEMIC PHARMACOLOGIC EFFECTS ON ANGIOTENSIN METABOLISM

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Objective: The Renin-Angiotensin-System is a peptide hormone cascade that is involved the regulation of blood pressure and fluid balance. All enzymatic components of the RAS are present in the circulation, giving rise to a so-called systemic RAS. However, local tissue specific and even intracellular formation of angiotensin II (Ang II), the main RAS effector, has been reported. It is well known that ACE inhibitors (ACEi) are beneficial in the treatment of heart failure by blocking Ang II formation, while it is unclear if blocking the local or systemic RAS mediates their efficacy.

Design and method: In this single-center, exploratory cross-sectional study, the systemic and the local RAS activity was investigated by mass spectrometry. Heart transplanted (HTx) patients treated with ACEi (n=6) or without RAS blocking therapy (n=6) were analyzed regarding their systemic RAS metabolite profiles and the Ang II forming capacity of corresponding heart biopsy homogenates.

Results: ACEi treatment results in a renin mediated feedback activation of the systemic RAS. Systemic Ang II formation was efficiently blocked by ACEi therapy, while the local formation of Ang II in heart biopsies was found to be completely unaffected by ACE inhibition. In contrast, ex vivo treatment with chymostatin resulted in efficient blockade of Ang II formation in heart biopsies. Systemic RAS metabolite profiles were unaffected by chymostatin treatment.

Conclusions: Our findings underline the role of chymase in the local formation of Ang II in the human transplanted heart. Local Ang II formation was found to be unaffected by ACE inhibition, pointing to rather systemic than local mechanisms being responsible for the beneficial effects of ACEi in the treatment of heart disease. However, our data support the view that chymase might be a promising target in the treatment of RAS associated diseases of the human heart.

PP.33.29 CELL-SPECIFIC AND ENDOTHELIUM-DEPENDENT REGULATIONS OF MATRIX METALLOPROTEINASE-2 IN RAT AORTA

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Objective: Aortic stiffness inevitably increases with age and considerably accelerates during hypertension. Chronic activation of angiotensin II (ANGII) and matrix metalloproteinase-2 (MMP-2) during hypertension contribute to increased aortic stiffness. We studied signalling mechanisms employed by ANGII in the regulation of latent and active forms of MMP-2 in rat aortic endothelial and smooth muscle cells, along with isolated rat aorta.

Design and method: Pro-MMP-2 protein expression was quantified with western blot, whereas MMP-2 activity was assessed using gelatin zymography. Mulvany myograph was used to demonstrate a successful removal of endothelium from aorta.

Results: Our results show that ANGII (1 µmol/L) significantly ($p<0.01$) increases latent MMP-2 expression after 8 hours not only in endothelial and smooth muscle cells, but also in isolated rat aorta. We identified that ANGII acts via AT1 receptor activated cell-specific pathways. In endothelial cells, the JNK1 pathway is activated, whereas in smooth muscle cells the JAK2/STAT3 pathway. Results obtained in cell culture are in agreement with the results obtained in isolated aorta. However, active MMP-2 was not found under cell culture conditions, whereas in isolated aorta active MMP-2 was significantly ($p<0.05$) increased after stimulation with ANGII. This increase of MMP-2 activity was not inhibited by blocking pathways that control latent MMP-2 expression, but was abolished in the absence of endothelium. Our results demonstrate that ANGII regulates latent MMP-2 expression via cell-specific pathways in rat aorta. The endothelium plays an essential role in the activation of latent MMP-2.

Conclusions: Our findings offer new insights into molecular mechanisms potentially involved in aortic stiffness during hypertension and may lead to new strategies for inhibiting MMP-2 expression and activation in distinct cell types of the aortic wall.

PP.33.30 PROTECTION AGAINST VENTRICULAR ARRHYTHMIAS AND CARDIAC SERCA2A UPREGULATION AFTER SHORT-TERM ACE INHIBITION IN HEALTHY RATS

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Objective: Chronic angiotensin converting enzyme inhibitor (ACEIs) treatment can suppress arrhythmogenesis. To examine whether the effect is more immediate and independent of suppression of pathological remodelling, we tested the antiarrhythmic effect of short-term ACE inhibition in healthy normotensive rats.

Design and method: Wistar rats were administered with enalaprilat (ENA, i.p., 5 mg/kg every 12 h) or vehicle (CON) for two weeks. Intraarterial blood pressure in situ was measured in a. carotis. Cellular shortening was measured in isolated, electrically paced cardiomyocytes. Standard 12-lead electrocardiography was performed and, hearts of anesthetized open-chest rats were subjected to 6-min ischemia followed by 10-minute reperfusion to examine susceptibility to ventricular arrhythmias. Expressions of calcium regulating proteins (SERCA2a, cardiac sarco/endoplasmic reticulum Ca2+-ATPase; CSQ, calsequestrin; TRD, triadin; PLB, phospholamban; FKBP12.6, FK506-binding protein) were measured by Western blot and mRNA levels of L-type calcium channel (Cacna1c), ryanodine receptor (Ryr2) and potassium channels Kcnh2 and Kcnq1 were measured by qRT-PCR.

Results: ENA decreased intraarterial systolic as well as diastolic blood pressure (by 20%, and by 31%, respectively, for both $P<0.05$) but enhanced shortening of cardiomyocytes at basal conditions (by 34%, $P<0.05$) and under beta-adrenergic stimulation (by 73%, $P<0.05$). Enalaprilat shortened QTc interval duration (CON: 78±1 ms vs. ENA: 72±2 ms; $P<0.05$) and significantly decreased the total duration of ventricular fibrillations (VF) and the number of VF episodes ($P<0.05$). Reduction in arrhythmogenesis was associated with a pronounced upregulation of SERCA2a (CON: 100±20 vs. ENA: 304±13; $P<0.05$) and increased Cacna1c mRNA levels (CON: 1.00±0.16 vs. ENA: 2.18±0.44; $P<0.05$).

Conclusions: Short-term ACEI treatment can provide protection against I/R injury-induced ventricular arrhythmias in healthy myocardium and this effect is associated with increased SERCA2a expression.

PP.33.31 ANGIOTENSIN II IMPAIRS HEMATOPOIETIC STEM CELL PROLIFERATION, DIFFERENTIATION AND ENGRAFTMENT: IMPLICATION IN HYPERTENSION

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Objective: Emerging evidence indicates that differentiation and mobilization of hematopoietic stem cell (HSC) are critical in the development and establishment of hypertension-linked vascular pathophysiology. This, coupled with the intimate involvement of a hyperactive renin-angiontensin system in hypertension, led us to propose the hypothesis that chronic angiotensin II (Ang II) infusion would impair HSC at the bone marrow (BM) level regulating its proliferation and differentiation.

Design and method: 1) Ang II was chronically infused into C57BL6 mice (1000ng/kg/min) for 3 weeks. This resulted in an increase in MAP of 35±10 mmHg. Bone marrow, peripheral blood and splenocytes from control and Ang II-treated mice were analyzed using FACS. 2) GFP+ Sca-1+, c-Kit+, Lin- (SKL) HSC were isolated, pre-incubated with Ang II for 24h (100µg/ml) and injected into lethally irradiated C57BL6 mice. Donor derived GFP+ cells were analyzed by FACS and histology to evaluate engraftment efficiency.

Results: We observed a 51% increase of HSCs in the BM of Ang II treated mice. In addition, there were 29-52% increases in the number of CX3CR1+/Gr-1- monocyte in the peripheral blood and spleen. These changes in HSC and myeloid cells were blocked by Losartan (60mg/kg/day). Next, we investigated if Ang II affects HSC homing and engraftment efficacy, the critical steps for BM transplantation. We observed significant delays of homing when HSCs were injected in Ang II infused recipient animals. In addition, HSC pretreated with Ang II failed to efficiently engraft to the innate osteoblastic niche. Consistent with this observation, colony formation unit-Spleen in the Ang II infused recipients was reduced to 65% compared to control mice. Serial transplantation of the Ang II exposed SKL cells showed depletion HSC with no long term reconstitution.

Conclusions: These observations demonstrate that 1) chronic Ang II infusion impairs the engraftment ability of HSC in the BM, 2) This is mediated by the AT1R on HSC and 3) Ang II accelerates HSC differentiation into myeloid lineage. These multifaceted roles of Ang II indicate that Ang II acts as an important regulator of HSC in the BM and may be critical in establishment of hypertension induced vascular pathophysiology.

PP.33.32 ASSESSMENT OF THE EFFECTS OF TRYPTOPHAN CONTAINING PEPTIDES FROM WHEY PROTEIN ON VESSEL TONE REGULATION AND ANGIOGENESIS

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Objective: Tryptophan containing peptides IW, VPP and IPP hydrolysed from milk whey protein alpha-lactalbumin proved to have an antihypertensive effect by acting as angiotensin converting enzyme (ACE) inhibitors. Another peptide,

EW, has been claimed to exert an anti-angiogenic effect. Because these actions are only scarcely quantified, this study addressed the relative potency of IW, EW, WE and WL on ACE inhibition and endothelial cell sprouting.

Design and method: IW, WL, EW, and WE were tested for their ACE inhibiting potency on extracts from rabbit lung and human plasma. Measurement of ACE activity was performed using benzoyl-glycyl-histidyl-leucin as substrate and measuring its hydrolysis to hippuric acid and histidyl-leucin by UV-HPLC. Anti-angiogenic effects of peptides were addressed using human umbilical vein endothelial cells in a 3D fibrin gel bead assay, where their impact on sprouting was quantified by calculating the number of sprouts/bead.

Results: IW showed marked inhibitory potencies on rabbit lung and human plasma ACE (IC50 = 1.8 µM and 38.8 µM, respectively) in comparison to EW (IC50 = 26.2 µM and 56.2 µM respectively) and WL (IC50 = 41.4 µM and 81.6 µM respectively). This effect was modest as compared to captopril (IC50 = 3.8 nM and 1.1 nM respectively). WE did not show any ACE inhibitory effect. With respect to angiogenesis, WE and EW revealed a significantly stronger effect in the sprouting assay (0.2 and 0.24 sprouts/bead, respectively) in comparison to WL and IW (0.48 and 0.55 sprouts/bead, respectively). The effect was similar to that of endostatin (0.3 sprouts/bead).

Conclusions: This study shows that tryptophan containing peptides from whey protein show a clear structure dependency with respect to ACE inhibition and endothelial cell sprouting. Rank order of peptides with respect to ACE inhibition and antisprouting effects may be clearly separated.

PP.33.33 EFFECT OF CATHETER-BASED RENAL DENERVATION ON RENIN-ANGIOTENSIN-ALDOSTERONE SYSTEM IN PATIENTS WITH RESISTANT ARTERIAL HYPERTENSION

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Objective: Renal denervation is an invasive method of treatment for patients with drug resistant arterial hypertension. It is based on radiofrequency ablation of sympathetic nerves localized in renal artery walls. The aim of our study was to assess the influence of catheter-based renal denervation (RD) on renin-angiotensin-aldosterone system (RAS) and on blood pressure level (BP) in patients with resistant arterial hypertension.

Design and method: We enrolled 27 (16 men) patients, average age 62.9±8.7 years, who underwent RD between 07/2011 and 05/2013. Office BP levels, ambulatory blood pressure monitoring (ABPM) and assessment of plasma renin activity (PRA) and aldosterone level measurement were performed before RD and after 6 months.

Results: Mean office BP before RD was 166.8±19.2/99.4±15.2 mmHg, mean 24h ABPM BP was 147.5±16/79.6±11.4 mmHg. Baseline plasma aldosterone level was 163.8±135.4 ng/l, PRA 1.5±2.4 µg/l/h, average aldosterone-renin ratio (ARR) was 70.3±118.2. After 6 months, we have found statistically significant decrease of office BP of 23.8±23/11±13.2 mmHg ($p<0.001$) and 24h ABPM pressure of 7.6±9.1/3.1±6.1 mmHg ($p<0.005$ for systolic and $p<0.014$ for diastolic BP). We have also found significant decrease of aldosterone level by 55.4±101.9 ng/l ($p=0.026$). Following values were not influenced statistically significantly by RD: PRA (increase of 0.7±4.8 µg/l/h, $p=0.378$) and ARR (decrease of 27.3±112.0, $p=0.681$).

Conclusions: Catether-based renal denervation leads to statistically significant decrease of blood pressure accompanied by decrease of plasma aldosterone levels.

PP.33.34 LOW PLASMA RENIN ACTIVITY IS AN INDEPENDENT PREDICTOR OF NEAR-TERM INCIDENCE OF HYPERTENSION IN MIDDLE-AGED ASIAN POPULATION

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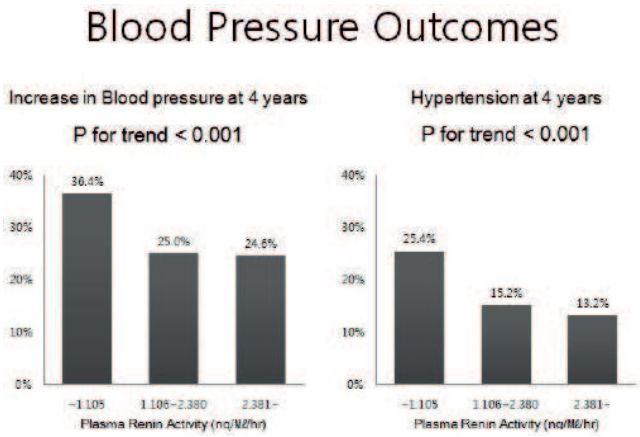
Objective: Plasma renin activity (PRA) has been associated with increase of blood pressure and 3-4 year incidence of hypertension in Western population. We confirmed the association of PRA with development of hypertension in Asian population. We also assessed the interaction between urinary sodium excretion and PRA on the development of hypertension.



Design and method: We investigated the relation of baseline PRA to increases in blood pressure and the incidence of hypertension after four years in 2,146 non-hypertensive individuals from a community-based Korean population (mean age, 50years), 58 percent of whom were women. We defined an increase in blood pressure as an increment of at least one blood-pressure category (normotensive, prehypertension, and hypertension) and defined hypertension as a systolic blood pressure of 140 mm Hg or higher, a diastolic blood pressure of 90 mm Hg or higher, or the use of antihypertensive medications.

Results: After 4years, the blood-pressure category had increased in 28.6 percent of the participants, and hypertension had developed in 17.8 percent. After adjustment for possible confounding factors, lowest tertile of PRA was an independent risk factor of an elevation in blood pressure (Adjusted Odds Ratio[OR] 1.64, 95% confidence interval[CI] 1.27-2.11, $p<0.001$) and hypertension (Adjusted OR 1.93, 95% CI 1.41-2.65, $p<0.001$). The associations between the PRA and blood-pressure outcomes were more evident in adults with high urine sodium excretion.

Conclusions: In our community-based sample, PRA was associated with development of hypertension.

PP.33.35 FACILITATORY EFFECTS OF GINTONIN, A COMPONENT ISOLATED FROM KOREAN RED GINSENG ON ADRENAL CATECHOLAMINE SECRETION

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Objective: Previously, We have found that all of total Ginseng saponin (TGS), panaxadiol- and panaxatriol-type saponins cause the increased secretion of catecholamines (CA) from the isolated perfused rabbit adrenal glands (Lim et al., 1987; 1988; 1989), while TGS rather inhibits the CA secretion from the isolated perfused rat adrenal glands (Hong et al., 1999) and SHRs (Jang et al, 2011). Therefore, the present study was designed to investigate the characteristics of gintonin, one of components isolated from Korean Ginseng on CA secretion from the perfusated model of rat adrenal gland and to clarify its mechanism of action.

Design and method: The adrenal gland was isolated and perfused with Krebs-bicarbonate. CA was measured directly by using the fluorospectrophotometer.

Results: Gintonin (1 to 30 µg/ml), perfused into an adrenal vein, evoked the significant increased secretion of catecholamines (CA) from the rat adrenal gland in a dose-dependent fashion. The gintonin-evoked CA secretion was markedly inhibited in the presence of chlorisondamine (1 µM, an autonomic ganglionic bloker), pirenzepine (2 µM, a muscarinic M1 receptor antagonist), losartan (15 µM, an angiotensin II receptor antagonist), Ki 14625 (10 µM, a LPA receptor antagonist), amiloride (1 mM, a Na+ channel blocker), a nicardipine (1 µM, a voltage-dependent Ca2+ channel blocker), TMB-8

(1 μM, an intracellular Ca2+ antagonist), and perfusion of Ca2+-free Krebs solution with 5mM EGTA (a Ca2+chelater), while was not affected by sodium nitroprusside (100 μM, a nitrosovasodialtor). Moreover, the CA secretion evoked by acetylcholine was greatly potentiated during the perfusion of gintonin (3 μg/ml).

Conclusions: Taken together, these results demonstrate that gintonin increases the CA secretion from the perfused rat adrenal medulla in a dose-dependent fashion. This facilitatory effect of gintonin seems to be associated with activation of LPA-, cholinergic- and angiotensin II-receptors, which are relevant to the cytoplasmic Ca2+ increase by stimulation of the Ca2+ influx as well as by inhibition of Ca2+ uptake into cytoplasmic Ca2+ stores, without the increased NO. Based on these results, it is thought that gintonin can elevate the CA secretion from adrenal medulla by regulating Ca2+ mobilization for exocytosis, suggesting facilitation of cardiovascular effects.

PP.33.36 ESTRADIOL INCREASES ENDOTHELIAL CELL EXPRESSION OF ECA1 AND ECA2

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Objective: Endothelial cells express the majority of enzymes responsible for the production of peptides of the renin-angiotensin system (RAS). Endothelial cells also express estrogen receptors. Estradiol exerts many vascular actions acting by modulating endothelial physiology. Previous reports from our group suggested estradiol regulates RAS mRNA expression in endothelial cells through estrogen receptors. Our aims were to analyze the regulation by estradiol of angiotensin converting enzyme (ACE) 1 and 2 (the main enzymes of RAS) in human umbilical vein endothelial cells (HUVEC) and its repercussion on endothelial cell function.

Design and method: HUVEC were exposed to different, physiological concentrations (1-10 nM) of estradiol for 24 hours. Cells were exposed to specific agonists of estrogen receptor (ER) α (PPT), β (DPN) and GPER (G1) and to antagonists of ER (unspecific, ICI182780, and selective for ERα, MPP) to analyze their role on the observed effects. The expression of ACE1 and ACE2 was analyzed by RT-PCR and immunoblotting. Their activities were measured by fluorometry by using specific substrates (N-Hippuryl-His-Leu-hydrate for ECA1, Mca-APK-Dnp for ECA2). ANOVA test and then Bonferroni's test were performed. Data are expressed as a percentage of control values, and are mean ± SEM.

Results: The expression of ECA2 in HUVEC was almost undetectable by RT-PCR. Nevertheless, the expression of both ECA1 and ECA2 was detected by immunoblotting. Estradiol increases the expression of both ECA1 and ECA2 proteins to similar levels (127±9 and 128±9 of control values, $p<0.05$). In both cases, the effects were mediated by ERβ, since DPN exerted the same effect than estradiol. G1 also stimulates ECA2 expression to a similar extent. The control enzymatic activity for ECA1 and ECA2 were 0.66±0.15 and 0.010±0.002 nmol/min x mg protein, respectively. Estradiol slightly increases both activities.

Conclusions: HUVEC express both ECA1 and ECA2. Estradiol increases the expression of ECA1 and ECA2 acting through ERβ and GPER.

PP.33.37 ANGIOTENSIN-(1-7) PROTECTS FROM CENTRAL NERVOUS SYSTEM DAMAGE INDUCED BY SHIGA TOXIN 2-PRODUCING ENTEROHEMORRHAGIC ESCHERIA COLI

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Objective: Angiotensin (Ang) (1-7) is the main component of the depressor arm of the renin-angiotensin system. Several evidences showed a cerebroprotective action for Ang-(1-7) but neither of them demonstrated the cellular target for this protective effect. Our aim was to investigate the cellular target protected by Ang-(1-7) in the model of central nervous system damage-induced by Shiga toxin 2 (Stx2)-producing enterohemorrhagic Escherichia Coli.

Design and method: Rats were injected with saline solution or Stx2 or Stx2 plus Ang-(1-7) or Stx2 plus Ang-(1-7) plus A779, into the anterior hypothalamic area (AHA). Rats received a single injection of Stx2 at the beginning while Ang-(1-7), A779 or saline was given daily as a single injection during 8 days. Ultrastructural changes were analyzed by transmission electron microscopy.

Results: Stx2 induced neurodegeneration, axon demyelination, alterations in synapse and oligodendrocyte and astrocyte damage, accompanied with edema. Ang-(1-7) partially prevented neuronal damage: 55.6±9.5 of the neurons were protected from the damage triggered by the toxin. Ang-(1-7) hampered the Stx2-induced demyelination in 92±4% of the axons as well as astrocyte and oligodendrocyte damage. The synapse dysfunction caused by Stx2 was reverted by Ang-(1-7). All these beneficial effects of Ang-(1-7) were blocked by A779, the Mas receptor antagonist.

Conclusions: Ang-(1-7) protects neurons, oligodendrocytes and astrocytes in the central nervous system through Mas receptor stimulation.

PP.33.38 THE ANGIOTENSIN-(1-7) MAS RECEPTOR IS RECYCLED BACK TO THE PLASMA MEMBRANE UPON AGONIST STIMULATION

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Objective: Receptor trafficking has critical function in signal termination and propagation as well as receptor resensitization. Previously we have shown that Mas receptor desensitizes and internalizes upon stimulation with Ang-(1-7). Our aim was to investigate Mas receptor intracellular trafficking once the receptor is internalized.

Design and method: We generated a chimera between the Mas R and the fluorescent protein YFP (MasR-YFP). MasR-YFP transfected HEK 293T cells were incubated with 1 μM Ang-(1-7) during different times and the relative cellular distribution of MasR-YFP was observed by confocal microscopy. Recycling of Mas receptor was evaluated by measuring Mas receptor present in the plasma membrane by ligand binding assay in transfected cells previously incubated in the absence or presence of 1 μM Ang-(1-7).

Results: Following endocytosis, receptors may be either recycled to the plasma membrane or sorted for lysosomal degradation. No colocalization of MasR-YFP with Rab 4, a fast recycling endosome back to the cell surface marker, was observed. Conversely, the Mas receptor signal colocalized with Rab 11, a slow recycling endosome back to the cell surface marker, after 30 and 60 min stimulation with Ang-(1-7). Furthermore, MasR-YFP did not co-localizes with either Lamp-1, a lysosomal marker, or Lyso Tracker Red DND-99, a fluorescent acidotropic probe for lyosomes labeling, in any of the time treatments assayed, suggesting that the receptor is not sorted to lysosomes upon agonist stimulation. In transfected cells stimulated with Ang-(1-7) recycling of Mas receptor was observed after 30 min and this effect lasted up to 90 min.

Conclusions: Our results show that Mas receptor is recycled back to the cell surface in a resensitized state competent for signaling after agonist stimulation.

PP.33.39 AT4 RECEPTOR/INSULIN REGULATED AMINOPEPTIDASE INHIBITION PROTECTS AGAINST ANGIOTENSIN II-INDUCED CARDIAC FIBROSIS AND VASCULAR DYSFUNCTION

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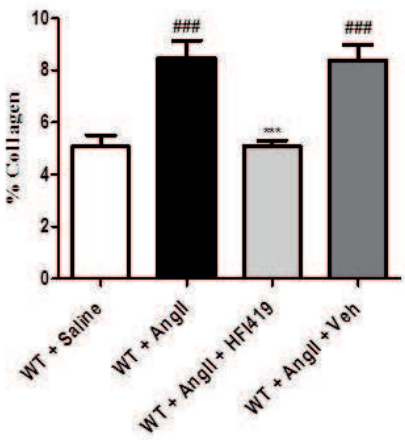
Objective: We have previously shown that the AT4 receptor is upregulated in a vascular injury model and in atherosclerotic lesions of high fat diet fed ApoE KO mice indicating a potential role for this receptor in vascular remodeling. In fact chronic treatment with the endogenous ligand for the AT4 receptor, Angiotensin (Ang) IV is both vaso- and athero-protective in aorta from ApoE KO mice. However the AT4 receptor is now known to be the enzyme, insulin regulated aminopeptidase (IRAP) with Ang IV hypothesised to mediate effects via inhibition of the catalytic site of this enzyme. Therefore using the novel, synthetic IRAP inhibitor, HFI419, we investigated whether direct IRAP inhibition would prevent development of Ang II-induced cardiac hypertrophy, fibrosis and endothelial dysfunction.

Figure 1



Design and method: Male WT (C57Bl/6J) mice aged ~4 months were chronically infused with saline, Ang II (4 weeks; 800ng/kg/min), the synthetic IRAP inhibitor, HFI419 (500ng/kg/min) or HFI419 vehicle for 4 weeks.

Results: Chronic inhibition of IRAP had no effect on Ang II-induced hypertension but did prevent Ang II-induced cardiomyocyte hypertrophy. Furthermore, Ang II-induced collagen deposition was also completely abolished with IRAP inhibition (Figure 1), which was correlated with decreased TGF-β expression and reduction in α-SMA expressing myofibroblasts. IRAP inhibition also reduced inflammation with a significant decrease in NFκB activation compared to saline- and vehicle-treated controls. Concomitant treatment with an IRAP inhibitor also prevented Ang II-induced endothelial dysfunction which appeared to be correlated with overall improved NO bioavailability and decreased inflammation in aorta of these mice. Moreover, results of the current study were similar to those achieved in analogous studies using IRAP deficient mice that also demonstrated a vaso- and cardio-protective phenotype.

Conclusions: The vaso- and cardio-protective phenotype observed in IRAP deficient mice could be mimicked by pharmacological inhibition of IRAP catalytic activity. These studies provide proof-of-concept that IRAP inhibition mediates both cardio- and vaso-protection, highlighting the importance of targeting this enzyme in the management of cardiovascular disease.

PP.33.40 ACTIVITY OF ANTIOXIDANT ENZYMES IN PERIODONTAL DISEASE IN SPONTANEOUSLY HYPERTENSIVE RAT

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Objective: Different studies show that systemic diseases such as diabetes, hyperthyroidism, osteoporosis and dyslipidemia may influence periodontal disease (PD). However, the influence of high blood pressure in periodontitis disease is unknown. PD is an inflammatory condition which destroys the fibers of the periodontal ligament and alveolar bone. The host response includes overproduction of reactive oxygen species (ROS) which induces chain reactions capable of damaging biological significant molecules. Angiotensin II (ANGII) increases ROS and acts as a pro-inflammatory cytokine. The role of ANGII and its AT1 receptor (AT1R) in the PD is elusive. Thus, we assessed the role of the ANGII/AT1R in PD in spontaneously hypertensive rats (SHR) and normotensive Wistar Kyoto rats (WKY), evaluating the effect of valsartan, an AT1 receptor antagonist, on blood pressure, leukocyte count, gingival enzymatic activity of three anti-oxidant enzymes: catalase (CAT), superoxide dismutase (SOD) and glutathione peroxidase (GPx).

Design and method: WKY and SHR male rats, 280-300g body weight, were divided into four experimental groups: SHR + Val (11 days); SHR+ Vehicle; WKY + VAL (11 days) and WKY + Vehicle. Blood pressure was measured at the beginning and end of treatment. The animals were euthanized by decapitation and blood samples were taken from the caudal vein for leukocyte counts. The gingivas were dissected, homogenized and centrifuged. The activity of the CAT, SOD and GPx was determined by spectrophotometry.

Results: Our results show an increase in the total leukocytes count, CAT and SOD activities in SHR when compared with WKY. While GPx activity was reduced in SHR. These effects were reversed by VAL treatment.

Conclusions: Our results suggest a role for ANGII/AT1R in the pathogenesis of Periodontal disease. These findings open new possibilities in the treatment of Periodontal Disease.

PP.33.41 ARB CAN DECREASE INTRARENAL RAS ACTIVITY RESULTING IN RESTORATION OF NON-DIPPER CIRCADIAN BP RHYTHM

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Objective: We previously reported that a treatment with thiazide diuretics (HCTZ) can restore non-dipper BP rhythm, and we also have postulated that angiotensin receptor blocker (ARB) can exert a diuretic effect, which had been exhibited in the experimental model. To translate the experimental findings into clinical scene, we explore the pathologic condition where the ARBs could increase a natriuresis in patients with chronic kidney disease and hypertension.

Design and method: Study 1: whether ARB can restore non-dipper BP rhythm and whether the restoration can accompany a lowering of sodium balance during the chronic phase of ARB treatment (8 wk), Study 2: whether intrarenal activation of renin-angiotensin system (RAS) can enhance a tubular sodium reabsorption resulting in non-dipper BP rhythm, and Study 3: whether diuretic effect of the combination treatment with ARB and HCTZ can enhanced in patients with activated intrarenal RAS.

Results: Eight-week treatment with ARB could attain the lower sodium balance and could restore non-dipper BP rhythm accompanying increase in daytime natriuresis. ARB also decreased the trans-tubular potassium concentration gradient (p=0.002), indicating that ARB could diminish the effect of aldosterone on renal tubular reabsorption of Na+ and secretion of K+ at the primary sites of potassium secretion. Tubular sodium reabsorption is stimulated by intrarenal angiotensin II, as indicated by proximal tubular expression of angiotensinogen (AGT), and contributes to the pathogenesis of non-dipper BP rhythm. Larger diuretic effect could be demonstrated in patients with activated intrarenal RAS, as indicated by urinary AGT excretion rate (r=0.69, p=0.05).

Conclusions: In patients with CKD, non-dipper type of circadian BP rhythm can be attributable to tubular sodium reabsorption enhanced by intrarenal RAS. ARB may calm down the inappropriate activation of intrarenal RAS, and can restore the non-dipper BP rhythm. Therefore, the diuretic effect of the combination treatment with diuretics and ARB is expected in patients with augmented urinary excretion of AGT.

PP.33.42 EFFECTS OF ADD-ON ADMINISTRATION OF HCTZ TO THE PRECEDING ARB TREATMENT ON SODIUM BALANCE, CIRCADIAN BP RHYTHM AND URINARY ANGIOTENSINOGEN

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Objective: Previously, we have reported that the angiotensin receptor blocker (ARB) or thiazide diuretic (HCTZ) can restore the circadian blood pressure (BP) rhythm, and we proposed that the restoration was attributable to an increase in daytime natriuresis.

Design and method: We studied the change in the urinary excretion rate of angiotensinogen (UAGTV), and examined whether lower sodium balance and restoration of non-dipper BP rhythm can be attained during the add-on administration of HCTZ to the preceding ARB treatment. Major inclusion criteria were: 1) chronic kidney disease (K/DOQI), 2) previous treatment with ARB (valsartan, 80 mg/d) for >=two months, 3) office BP >130/80 mmHg. Three male and seven female (71±8 year-old, GFR 76.8±59.8ml/min/1.73m2), were studied before and 8-wk add-on treatment of HCTZ (12.5 mg/d) to the ARB.

Results: Filtered sodium load (SNa x GFR, 11870±6880 → 10160±6270 mmol/day, p=0.005), tubular sodium reabsorption (tNa, 11700±6830 → 10020±6280 mmol/day, p=0.004), and fractional sodium reabsorption [tNa/(SNa x GFR), 98.6±0.7 → 98.2±1.2%, p=0.3] were all decreased. Urinary protein excretion (1.6 → 0.8g/gCre, p=0.03) was attenuated. UAGTV was changed from 662±956

to 318±436 μg/gCre (p=0.1), but it increased or decreased from patient to patient. BP were lowered for both daytime [133/80 → 129/74 (SBP, p=0.2, DBP, p=0.007), and night-time [121/75 → 115/74 (SBP, p=0.1; DBP, p=0.003)]. Daytime natriuresis increase inversely correlated with baseline UAGTV (r=-0.69, p=0.05).

Conclusions: Add-on administration of HCTZ to preceding ARB treatment can attain the lower sodium balance, but the night/day BP ratio was not reduced because of the BP lowering for both daytime and night-time. Daytime increase in natriuresis can be attained in patients, in whom intrarenal RAS was suppressed by preceding ARB treatment. Further studies are needed to investigate whether UAGTV can be a useful predictor for diuretic effect of combination treatment with HCTZ and ARB.

PP.33.43 INTESTINAL MEMBRANE PERMEABILITY OF DRIED BONITO-DERIVED DIPEPTIDES WITH ANTIHYPERTENSIVE EFFECTS IN VIVO AND THE RELATED MECHANISM OF ACTION

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Objective: Antihypertensive components are typically assessed by screening based on in vitro results; however, since intestinal absorption is closely involved in the antihypertensive mechanism of action, we attempted to analyze the absorption of bonito-derived peptides (KBP), which have been found to have antihypertensive effects in animal experiments.

Design and method: The intestinal tracts of rats (7-week-old male SD rats) were excised after performing cervical dislocation. Incisions (5.5 cm) were quickly made into the jejunum, one side was ligated and inverted, and after injecting 1 mL reaction solution, the other side was ligated to create an inverted sack. The sack was then quickly placed in 30 mL of the reaction solution (antihypertensive amount: KBP 0.3 mg/per animal and syntheticpeptides: each 0.25 mM) and left to react for 30 minutes at 37°C after which the inverted sack was removed and washed gently with physiological saline before recovering all the internal fluid.

Results: Pretreatment conditions involved adding 5 μL water and 5 μL of 20% sulfosalicylic acid to a 50 μL intestinal fluid sample, stirring the sample, transferring 0.22 μm to a centrifugal filter, performing centrifugation for 3 min at 20,000 ×g and 4°C, and then injecting the filtrate into the LC/MS/MS system(using the API5000 , ESI-positive ionization mode). The recovery rate of each synthetic dipeptide was 110.4, 91.5, 87.4, 90.0, 94.6, 96.5, 76.1, and 104.2 ng/ml for GW, AW, VW, MW, IW, LW, WL, and IS, respectively, with a lower value for WL. Based on the above analysis conditions, the GW, AW, VW, MW, IW, LW, and WL values (ng/mL) of KBP in the reaction solution were 34.0, 4.64, 7.11, 1.28, 12.7, 4.57, and 0.923, respectively, and 53.2, 3.92, 6.02, 1.10, 8.76, 5.76, and 0.785, respectively, for 0.25 mM synthetic components. Values for the reaction solution of additive-free peptides serving as a base were estimated at 13.5, 1.09, 2.06, 0.350, 5.54, 1.72, and 0.189, respectively.

Conclusions: The intestinal membrane permeability of dried bonito-derived dipeptides, which have an antihypertensive effect in vivo, suggests that dipeptides absorbed from the intestinal membrane may have an antihypertensive effect.

PP.33.44 HIGH ALDOSTERONE-RENIN RATIO (ARR) IS ASSOCIATED WITH THE DEVELOPMENT OF ESSENTIAL HYPERTENSION FROM WHITE COAT HYPERTENSION

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Objective: The renin-angiotensin-aldosterone system (RAAS) plays an important role in blood pressure regulation and other cardiovascular risks. Although, there are many reports about white coat hypertension (WCH), still the clinical significance and pathophysiology of WCH is ambiguous. The aim of this study was to find out the difference of RAAS activity in WCH compared with the essential hypertension (EH) group, which could suggest the role of RAAS activity in the development of WCH.

Design and method: Never treated hypertension patients who visited 8 hospitals of The Catholic University of Korea from January 2011 through July 2013 were enrolled. WCH was defined as high office blood pressure (BP) (>140/90 mmHg), but normal blood pressure measured by day time ambulatory blood pressure monitoring (ABPM) (<135/85 mmHg). Of the 869 never treated patients with high office BP, 146 (age 47±11) patients who underwent ABPM and examined plasma renin activity (PRA) and plasma aldosterone level (PAL) were identified. PAL/PRA ratio (ARR) was calculated and patients with the possibility of primary aldosteronism (ARR > 27 ng/dl per ng/ml/hr) were excluded. Among the patients, one hundred eighteen patients were diagnosed with EH (age 47±10), and eighteen patients were diagnosed with WCH (age 47±15). The PRA, PAL, and ARR in patients with WCH were compared with the EH group.

Results: There were no significant differences with age and other cardiovascular risk factors.(Table 1.) Although, PRA [(2.1 ± 1.3 ng/ml/hr) in WCH, (1.7 ± 1.4 ng/ml/hr) in EH, p=0.20] and PAL [(12.5 ± 6.5 ng/dL) in WCH, (10.6 ± 8.4 ng/dL) in EH, p=0.37] did not show a significant difference between the two groups, ARR was significantly lower in patients with WCH (6.7 ± 3.1) compared to the EH group. (8.7 ± 6.5, p=0.04)

	EH(n=118)	WCH(n=18)	P value
Age	47.1±10.3	47.3±14.6	0.95
DM(%)	4(3.4)	1(5.6)	0.57
ACR	39.2±43.8	32.7±65.2	0.59
BMI(kg/m²)	25.4±3.3	27.2±6.5	0.26
EKG LVH(%)	17(14.7)	3(16.7)	0.89
T cholesterol(mg/dl)	201.1±36.2	195.8±32.6	0.59
LDL(mg/dl)	117.5±35.2	117.6±29.0	0.99
HDL(mg/dl)	51.0±13.7	49.9±11.9	0.75
Creatinine(mg/dl)	0.8±0.2	0.8±0.2	0.57
PRA(ng/ml/hr)	1.7±1.4	2.1±1.3	0.20
PAL(ng/dl)	10.6±8.4	12.5±6.5	0.37
PAL/PRA ratio	8.7±6.5	6.7±3.1	0.04

Conclusions: ARR is significantly low in WCH compared to EH. Since ARR reflects aldosterone activity and target organ damage in especially hypertensives, high ARR may play a role in progression from WCH to EH.

PP.33.45 HETEROGENEOUS NUCLEAR RIBONUCLEOPROTEIN F NORMALIZES RENAL ANGIOTENSIN-CONVERTING ENZYME 2 EXPRESSION AND PREVENTS SYSTEMIC HYPERTENSION IN DIABETIC AKITA TRANSGENIC MICE

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Objective: We have reported previously that overexpression of heterogeneous nuclear ribonucleoprotein F (hnRNP F, a transcription factor) in renal proximal tubular cells (RPTCs) inhibits renal angiotensinogen (Agt, the sole precursor of all angiotensins) gene expression and prevents systemic hypertension and kidney injury in type 1 diabetic Akita transgenic (Tg) mice (Diabetes, 2012). The objective of present study is aimed to investigate whether hnRNP F stimulates renal angiotensin-converting enzyme 2 (Ace2, an enzyme that converts angiotensin II to angiotensin 1-7) expression and study its underlying mechanism(s) of action in Akita mice.

Design and method: Adult (20 weeks of age) male wild type (WT), Akita and Akita hnRNP F- Tg mice were studied. Kidneys were processed for histology. Ace2, transforming growth factor-beta 1 (TGF-β1) and TGF-β receptor II (TGF-β RII) mRNA and their protein expression in renal proximal tubules (RPTs) were evaluated by real time-qPCR and Western blotting, respectively. Freshly isolated mouse RPTs were studied ex vivo. Rat Ace2 gene promoter activity in pGL4.20 vector was studied in rat RPTCs in vitro.

Results: Akita mice exhibited increased systolic blood pressure (SBP) and glomerular filtration rate as compared to WT mice. Ace2 mRNA and their protein expression in RPTCs were significantly decreased whereas TGF-β1 and TGF-β RII mRNA and protein were increased in Akita mice compared to WT. These changes were normalized in Akita hnRNP F-Tg mice. Ex vivo, TGF-β1 inhibited Ace2 mRNA and protein expression in mouse RPTs and reversed by SB431542 (an inhibitor of TGF-β receptor I). In vitro, overexpression of hnRNP F increased Ace2 expression, whereas it inhibited TGF-β1 and TGF-β RII expression in rat RPTCs. TGF-β1 also attenuated Ace2 gene promoter activity and its effect was inhibited by SB431542 and small interference RNA of TGF-β RII. Finally, we identified a putative TGF-β1 responsive element in nucleotides N-1084 to N-499 upstream of transcriptional starting site of rat Ace2 gene promoter.

Conclusions: Our data suggest that intrarenal hnRNP F attenuates SBP and enhances Ace2 expression in RPTCs, predominantly through decreasing TGF-β1/TGF-β RII signaling.

PP.33.46 THE ANGIOTENSIN-(1-7) MAS RECEPTOR AND THE BRADYKININ B2 RECEPTOR INTERACT TO FORM A HETERO-OLIGOMER: FUNCTIONAL IMPLICATIONS

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Objective: It has been shown that G protein-coupled receptors (R) exist as homo- or hetero-oligomers, which is essential for receptor function. Since BK actions were blocked by a Mas R antagonist or that Ang-(1-7) responses disappeared when the BK receptor B2 was blocked, we hypothesized that Mas and B2 Rs on the plasma membrane may interact through hetero-oligomer formation. Our aim was to investigate the existence of heteromerization between Mas and B2 Rs by the fluorescence energy transfer (FRET) technique and the functional consequences of this oligomer formation.

Design and method: HEK293T cells were transfected with the coding sequence for Mas R fused to YFP and B2 R fused to CFP. After 48 h cells were incubated in the absence and presence of 1 μM Ang-(1-7) or BK during 15 min and interaction between Mas and B2 R was evaluated by FRET. Functional consequences of this interaction were determined by ligand binding assays.

Results: A positive FRET was observed in cells cotransfected with MasR-YFP and B2R-CFP, suggesting that both Mas and B2 Rs interact by a hetero-oligomer formation in a constitutive manner. This hetero-oligomer was not altered by the agonist because FRET was not modified when the cells were stimulated with BK or Ang-(1-7). Ang-(1-7) or BK induced internalization of this hetero-oligomer into early endosomes since MasR-YFP or B2R-CFP colocalized with Rab-5, an early endosome marker, after ligand stimulation. When MasR-YFP plus B2R-CFP transfected cells were stimulated with Ang-(1-7) there was a decrease of 82±6% in Mas R and 58±4% in B2 R present in the plasma membrane. Conversely, when MasR-YFP plus B2R-CFP transfected cells were stimulated with BK there was a decrease of 91±4% in B2 R and 53±3% in Mas R in the plasma membrane.

Conclusions: Mas and B2 Rs constitutively interact through an hetero-oligomer formation at the plasma membrane which may explain the cross-talk between Ang-(1-7) and BK. This hetero-oligomer is internalized upon stimulation with either Ang-(1-7) or BK, leading to a decrease in the number of Rs present in the membrane.

PP.33.47 INCREASED LEVEL OF P63RHOGEF AND RHOA/RHO KINASE ACTIVITY IN HYPERTENSIVE PATIENTS

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Objective: p63RhoGEF, a guanine nucleotide exchange factor, has been reported "in vitro" as key mediator of the Angiotensin II-induced RhoA/Rho kinase activation leading to vasoconstriction and cardiovascular remodeling. We assessed p63RhoGEF gene and protein expression and RhoA/Rho kinase activity in essential hypertensive and Bartter's and Gitelman's syndrome patients, a human model opposite to hypertension; the latter have, in fact, increased plasma Angiotensin II, activation of the renin-angiotensin system, yet normotension/hypotension, reduced peripheral resistance and lack of cardiovascular remodeling due to an endogenously blunted Angiotensin II type 1 receptor signaling.

Design and method: Mononuclear cell p63RhoGEF gene and protein expression and the phosphorylation status of the myosin phosphatase target protein-1 (MYPT-1), marker of Rho kinase activity, were assessed in essential hypertensive patients, Bartter's/Gitelman's patients and healthy subjects by quantitative Real Time RT-PCR and western blot.

Results: p63RhoGEF mRNA and protein level and MYPT-1 phosphorylation status were higher in hypertensive patients and lower in Bartter's/Gitelman's patients compared to healthy subjects: p63RhoGEF mRNA level: 0.59±0.17 ΔΔ Ct vs 0.37±0.17 vs 0.20±0.19, ANOVA: $p<0.016$; p63RhoGEF protein level 1.35±0.14 d.u. vs 1.09±0.05 vs 0.90±0.09, ANOVA: $p<0.0001$; MYPT-1: 1.39±0.34 vs 1.01±0.12 vs 0.81±0.06, ANOVA: $p<0.0001$. p63RhoGEF mRNA was significantly correlated with both systolic and diastolic blood pressure in both hypertensive patients ($R=0.79$, $p<0.02$ and $R=0.78$, $p<0.02$) and in BS/GS patients ($R=0.87$, $p<0.001$ and $R=0.86$, $p<0.001$), respectively.

Conclusions: Increased p63RhoGEF mRNA and protein level and Rho kinase activity are shown for the first time in essential hypertensive patients while the opposite was found in Bartter's/Gitelman's patients, a human model opposite to hypertension. These results combined with other "in vitro" studies strongly support the crucial importance of p63RhoGEF in Ang II-mediated signaling involved in the regulation of blood pressure and its long-term complications in humans.

PP.33.48 NOVEL INSIGHTS IN THE MECHANISMS OF CENTRAL ANGIOTENSIN II TYPE 2 RECEPTORS ON BLOOD PRESSURE

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Objective: This study is designed to expand our understanding of the mechanisms of central blood pressure regulation by the angiotensin II type 2 receptor (AT2R) in rats. We investigated (1) the lowest effective dose of Compound 21 (C21) to decrease blood pressure, (2) the mechanism of action of the blood pressure lowering effect, and (3) a possible enhanced effect of C21 with additional central angiotensin II type 1 receptor (AT1R) blockade.

Design and method: Intracerebroventricular (icv) infusion was done by icv cannula implantation; drugs were infused through mini-osmotic pumps in conscious Wistar Kyoto rats (WKY). Cardiovascular (MAP, HR) parameters were measured using radiotelemetry devices (DSI). After 7 days of saline vehicle infusion, rats were divided into 7 groups (n=6-7): high dose C21 (0.5μg/μl/hr), high dose C21 + PD 123319(0.5μg/μl/hr), medium dose C21 (0.02μg/μl/hr), medium dose C21 + PD123319(0.02μg/μl/hr), low dose C21 (0.002μg/μl/hr), medium dose C21 + losartan (10μg/μl/hr), medium dose C21 + L-NAME(50μg/μl/hr).

Results: High and medium dose C21 both lowered MAP significantly from baseline values (C21 high dose -5.1 +/-0.6mmHg; C21 medium dose -7.7+/-0.9mmHg). Low dose C21 did not alter any parameter. PD123319 prevented the response to C21. L-NAME abolished the effects of C21 and even increased blood pressure significantly when co-infused (+4.7+/-0.9mmHg). Co-infusion of C21 and losartan did not enhance the MAP lowering effect.

Conclusions: In conclusion, the hypotensive response to C21 after icv infusion in conscious normotensive WKY rats is due to selective stimulation of the central AT2R that requires a functioning central nitric oxide pathway. Additional central AT1R blockade did not enhance the blood pressure lowering effects.

PP.33.49 THE SYSTEMIC RENIN-ANGIOTENSIN-SYSTEM IN HEMODIALYSIS PATIENTS: A MASS SPECTROMETRY-BASED MOLECULAR CHARACTERIZATION

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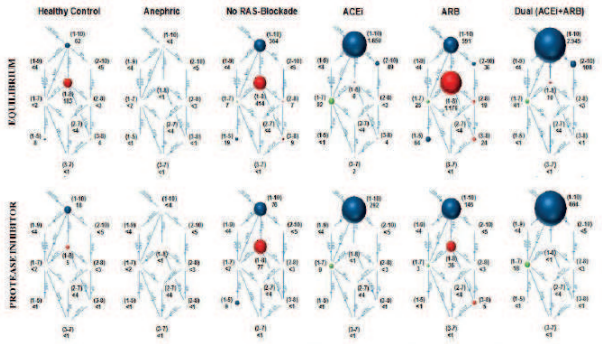
Objective: RAS blockade exerts beneficial effects in patients with chronic kidney disease (CKD), yet solid evidence suggesting similar benefits in hemodialysis (HD) patients is not available. Analyses of the effects of RAS blockers on systemic RAS components in HD patients are scarce. In the context of conflicting clinical data on RAS blockade, a personalized characterization of all systemic components of the systemic RAS may yield important pathomechanistic information of a widespread therapeutic measure.

Design and method: 52 HD patients from the following groups were analyzed cross-sectionally from a single institution: angiotensin-converting enzyme inhibitor (ACEi) users (n=8), angiotensin receptor blocker (ARB) users (n=11), patients on ACEi plus ARB (dual blockade, n=8), patients without RAS blockade (n=16) and anephric patients (n=9). Ten healthy volunteers served as controls. Angiotensin metabolites were quantified by mass spectrometry.

Results: In general, HD patients showed a broad variability of enzymes regulating the systemic RAS. Patients without RAS blockade displayed angiotensin metabolite patterns similar to healthy controls. ACEi therapy increased plasma Ang 1-10 and Ang 1-7 concentrations, whereas ARB treatment increased both Ang 1-8 and Ang 1-5, while suppressing Ang 1-7 to minimal levels. Dual RAS blockade resulted in high levels of Ang 1-10 and suppressed levels of other angiotensins. Anephric patients were completely devoid of detectable levels of circulating angiotensins.



Representative mass spectrometry-based RAS-Fingerprints of HD patients with different modes of RAS blockade

Conclusions: Treatment of patients with either ARB or ACEi resulted in specific angiotensin metabolite patterns. In HD patients the activity status of the whole systemic RAS is highly distorted with the emergence of crucial angiotensin metabolites upon distinct RAS blockers. Further studies are essential to understand potential clinical consequences of these altered profiles of the systemic RAS.

PP.33.50 HORMONAL EFFECTS OF ORAL GLUCOSE AND SODIUM CHLORIDE IN OBESE AND NONOBESE PATIENTS WITH ESSENTIAL HYPERTENSION

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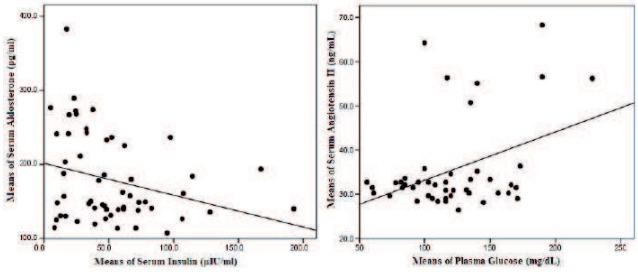
Objective: The aim of this study is to determine plasma glucose, insulin and renin- angiotensin - aldosterone system responses to oral glucose and NaCl in obese and nonobese patients with essential hypertension.

Design and method: 20 newly diagnosed untreated essential hypertensive patients were studied. Subjects with diabetes, hyperlipidemia, cardiac or renal impairment, smokers and those taking medications were excluded.
Patients fasted overnight (8- 10 hrs) then each subject took: 75gm glucose, 75gm glucose plus 3 gm NaCl dissolved in 250 ml; separated by at least 3 days with random sequence of experiments. Patients were monitored for 2 hours. Half hourly blood pressure (BP), plasma glucose (PG), serum insulin, angiotensin II (AngII) and aldosterone were measured. To assess insulin resistance (IR) HOMA index was calculated.

Results: Subjects were classified into obese (MBI> 30 Kg/m2) (n=11) and nonobese (MBI< 30 Kg/m2) (n=9). No significant difference was found in PG and serum insulin between obese and non obese hypertensive subjects. However, in obese hypertensive patients insulin showed significant positive correlation with: systolic BP after intake of glucose (P=.04) and glucose with NaCl (P=.03) and with diastolic BP (P=.04) and mean BP (P=.03) after intake of glucose alone. In nonobese hypertensive patients PG had positive significant correlation with AngII after intake of glucose alone (P=.05) and with NaCl (P=.007).
In obese hypertensive patients, serum aldosterone decreased significantly after intake of glucose with NaCl; it showed significant negative correlation with insulin (P=.04) and a significant positive correlation with AngII (P=.007).
In obese hypertensive patients IR had significant positive association with systolic BP (P=.000), diastolic BP (P=.04), mean BP (P=.001) and with AngII (P=.04). In nonobese patients IR correlated positively with AngII (P=.002) and aldosterone (P=.02).

Conclusions: Insulin may have a role in the pathophysiology of essential hypertension in obese hypertensive patients. The association of: IR with aldosterone and AngII, and PG with AngII suggests that sugar restriction may improve BP and glycemic control in obese and nonobese hypertensive patients.



PP.33.51 BLOOD PRESSURE SELF-MEASUREMENT AFTER RENAL DENERVATION

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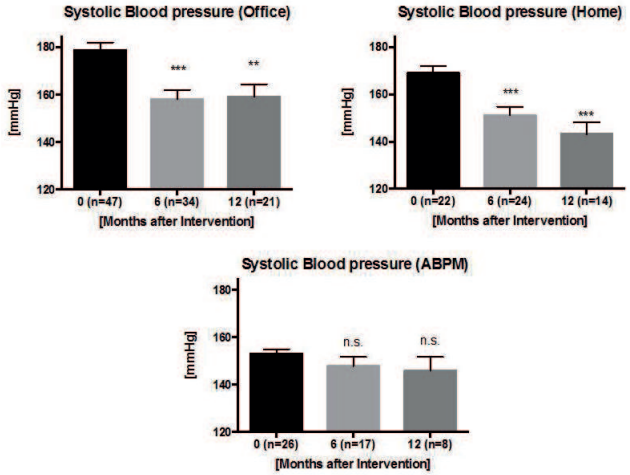
Objective: Renal denervation has been established in the treatment of resistant hypertension. Reduction in blood pressure is seen first after months up to one year. Office blood pressure and 24-hour ambulatory blood pressure (ABPM) monitoring are recommended for diagnosis and treatment control of arterial hypertension. However, if blood pressure measurement at home is useful to monitor the success of the intervention is unclear.

Design and method: In this prospective cohort study with 47 patients suffering from resistant hypertension, 20 women and 27 men, 62 years old SEM ±1.4,first diagnosed 13.8 years ago SEM ±1.7, receiving 5.3 SEM ±0.2 hypertension lowering agents, we measured blood pressure at standardized conditions before the intervention and after 6 and 12 months. Patients were introduced to standardized blood pressure measurement at home with a validated device. Data analysis were performed with Graphpad Prism Software using the Student's t-test. A p-value <0.05 indicates a statistically significant difference.

Results:



Conclusions: We performed catheter-based renal denervation in 47 patients without any complication. The procedure is effective and safe. Blood pressure measurement at home is a suitable method to monitor the effectiveness of the treatment. Nevertheless, more ABPM should be performed.

POSTERS' SESSION

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ORGAN DAMAGE

PP.34.01 CLINICAL USEFULNESS OF CARDIO ANKLE VASCULAR STIFFNESS INDEX (CAVI) FOR PREDICTING SUBCLINICAL CARDIAC ORGAN DAMAGE

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Objective: Increased arterial stiffness is acknowledged as an early marker of subclinical target organ damage (TOD) in hypertension. However, its use for risk stratification in daily practice is limited because of the relative complexity of its assessment. Cardio Ankle Vascular stiffness Index (CAVI) is a recently proposed, easy to obtain, non-invasive, blood pressure independent index of arterial stiffness. Aim of our study was to assess the relationship between CAVI and other indices of cardiovascular organ damage in hypertension.

Design and method: In 242 consecutive essential hypertensive patients (125 M/117F; age 18-75yrs) referred to our Hypertension Clinic we performed: echocardiography, carotid ultrasound examination (both with Vivid 7, GE), CAVI measurement (VaSera, Fukuda Denshi), renal function assessment (eGFR, CKD-EPI formula). CAVI was also used to subdivide our subjects based on age-specific reference values in two vascular age classes, respectively higher than (HVA) or corresponding to (normal, NVA) anagraphic age.

Results: CAVI showed a direct correlation with age (R=0.63, P<0.0001), left ventricular (LV) mass indexed for body surface area (R=0.24; p<0.001), or height2.7 (R=0.25; p<0.001), LV relative wall thickness (RWT: R=0.23; p<0.001), carotid intima-media thickness (cIMT; R=0.32; p<0.001), and eGFR (R=0.30; p<0.001). In multiple regression analysis age (p<0.001) and RWT (P<0.05) were independently associated with CAVI. CAVI was significantly higher in subjects with LV hypertrophy vs. those with normal LV mass (p<0.05) and in those with concentric vs. eccentric LV hypertrophy (p<0.05). NVA (N=136) and HVA (N=106) groups had similar clinical characteristics (NVA: 67M/69F, age 54.7yrs, office BP 138/86mmHg; HVA: 58M/48F, age 55.0yrs, office BP 141/88 mmHg, all NS).
HVA group had higher LV mass index and RWT than NVA group (p<0.01) with a higher prevalence of LV concentric remodeling. Also left atrium diameter and volume were higher in HVA group (p<0.01) with no differences in diastolic function parameters and aortic dimensions. The two groups showed similar cIMT and prevalence of carotid plaques (ns).

Conclusions: Our data show a significant relationship of CAVI with LV concentric remodeling pattern independent of age, suggesting that it may represent an easy tool for early detection of subclinical cardiac damage.

PP.34.02 BLOOD PRESSURE CONTROL IN TREATED HYPERTENSIVES IS SIMILAR BETWEEN THOSE WITH OPTIMAL OR WITH HIGH-NORMAL URINARY ALBUMIN EXCRETION

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Objective: Elevated urinary albumin excretion (UAE) is a well-known marker of subclinical organ damage and is associated with cardiovascular outcomes and high blood pressure (BP). Possible differences in BP control between patients with either optimal (<10 mg/g) or high-normal (10-29 mg/g) UAE have not been explored.
To analyze the association between UAE and BP control in a cohort of treated hypertensive patients, specially focusing on patients with optimal or high-normal UAE.

Design and method: A total of 1200 treated hypertensive patients in a stable therapeutic regimen for at least 3 months were evaluated. Clinical data including two office BP measurements and UAE averaged from two samples were recorded. Urinary albumin excretion was categorized into 4 groups: G0 (UAE <10 mg/g), G1 (UAE 10-29 mg/g), G2 (UAE 30-299 mg/g) and G3 (UAE >= 300 mg/g).

Results: The prevalence of patients with BP equal to or above 140 and/or 90 mmHg was 43%. Median UAE was significantly higher (20.3 vs. 11.7 mg/g; p<0.001) in patients with lack of BP control than in controlled hypertensives (BP < 140/90 mmHg). After categorizing the patients into the four aforementioned groups of UAE, there were differences in BP control among groups (p<0.001). Pairwise comparisons between groups revealed that the proportion of non-controlled patients in G2 (52.3%) was significantly higher than in G0 (36.8%) and G1 (41.5%) (p < 0.01 and p < 0.05, respectively), whereas there was no significant difference between G2 and G3 (47.9%); p=0.480. Importantly, no significant difference was observed between G0 and G1 (p=0.184). In a logistic regression analysis with G0 as the reference group, the odds ratio (95%CI) of lack of BP control for the G2 group after adjustment for confounders (age, sex, obesity, duration of hypertension, diabetes, estimated glomerular filtration rate as categorized by the threshold of 60 mL/min/1.73m2, and previous cardiovascular disease) was: 1.398 [1.163-1.680], p<0.001.

Conclusions: Lack of BP control is more prevalent among patients with microalbuminuria than in patients with normoalbuminuria. No significant difference was found between patients with optimal or high-normal UAE.

PP.34.03 ISOLATED NOCTURNAL HYPERTENSION AND TARGET ORGAN DAMAGE: A SYSTEMATIC REVIEW

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Objective: Much research has focused on night-time blood pressure including the dipping phenomenon and nocturnal hypertension. Isolated nocturnal hypertension (INH) was described more recently and was found to be associated with higher mortality and cardiovascular events. Subclinical target organ damage is a prognostic marker for future cardiovascular events. The objective of this systematic review is to summarise available literature on the association between INH and subclinical target organ damage.

Design and method: Original observational population based research studies were considered eligible. The study population were those recruited to population based studies undergoing 24 hour ambulatory blood pressure monitoring (ABPM). INH was defined as night-time blood pressure >=120/70 mmHg and daytime blood pressure <135/85 mmHg measured by ABPM. The search strategy was developed for PubMed and adapted for other databases. We systematically searched Pubmed, EMBASE and the Cochrane Library. Following a screen of titles, abstracts were reviewed by 2 independent reviewers. The full text of potentially eligible articles was obtained and compared with the inclusion criteria. A quality appraisal was carried out using published guidelines.

Results: The electronic search yielded 2517 titles. Following a screen of titles and removal of duplicates 13 abstracts were selected for review. The full text of 7 potentially eligible articles was obtained and 4 fulfilled the inclusion criteria. One Chinese study found INH was significantly associated with higher central and peripheral augmentation index, ambulatory arterial stiffness index and pulse wave velocity. Another study in the same population found no association with left ventricular hypertrophy documented by electrocardiogram. Only central aortic diastolic blood pressure was found to be higher in those with INH in a Swedish study. A sub-study of the Jackson Heart Study in the USA found higher left ventricular mass and greater odds of left ventricular hypertrophy in unadjusted analysis, while no association was seen for proteinuria.

Conclusions: Available evidence is inconclusive regarding the association between INH and subclinical target organ damage. Future research should focus on trying to elucidate the mechanisms that generate INH and contribute to the higher mortality associated with this blood pressure pattern.

PP.34.04 PROGNOSTIC VALUE OF FUNCTIONAL OR STRUCTURAL TARGET ORGAN DAMAGE STATUS ON CARDIOVASCULAR OUTCOME IN HYPERTENSIVE PATIENTS

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Objective: Aim of our study was to determine the prognostic value of functional or structural status of the kidneys, the carotid arteries and the heart on cardiovascular outcome in hypertensive patients.

Design and method: This is a prospective analysis including 565 treated or untreated hypertensive patients (female 50,8%, mean age at the entry: 55,9 years, mean office systolic/diastolic blood pressure: 150/93 mmHg, mean office heart rate: 75,5 beats/min, BMI 27,6 kg/m2). The median follow-up period was 9,6 years. All subjects underwent a complete echocardiography study and tissue Doppler imaging to estimate Left Ventricular Mass and left ventricular diastolic function. Moreover, all patients underwent carotid ultrasound for the assessment of carotid IMT and carotid plaque presence and morphology. Levels of serum creatinine and creatinine clearance were measured in venous blood sample or calculated, accordingly. Major cardiovascular events (MACE) (myocardial infarction, stroke, cardiovascular death) were registered. Cox proportional hazard model was employed to determine the prognostic value of functional and structural target organ damage status.

Results: The median follow-up period was 9,6 years. There were 214 (38%) MACE at the end of the study. Cox regression statistical analysis revealed that left ventricular mass indexes, end-diastolic filling of left ventricular as well as 24hr albuminuria are independent predictors of MACE (table 1).

Table 1. Cox regression model

	HR	95% CI	P value
LV mass	1,0042	1,002 – 1,0062	<0,001
LVMI/BSA	1,0073	1,0032 – 1,0115	0,0006
LVMI/Height	1,9784	1,4136 – 2,7688	0,0001
Maximum Transmitral A wave velocity	1,002	1,0011 – 1,0028	<0,001
Maximum transmitral E wave velocity	0,999	0,9979 – 1,0001	0,0718
E/A ratio	0,1838	0,936 – 0,3611	<0,001
eGFR	1,0019	0,9976 – 1,006	0,388
24hr albuminuria	1,0009	1,000 – 1,0018	0,05
Carotid IMT	0,711	0,092 – 5,44	0,7

LV=Left ventricular, LVMI=left ventricular mass index BSA=body surface area, IMT=intima media thickness.
HR= hazard ratio, 95% CI= 95% confidence interval,.

Conclusions: Left ventricular mass indexes, end-diastolic filling of left ventricular as well as 24hr albuminuria are independent predictors on cardiovascular outcomes in essential hypertensive patients, while structural status of carotid arteries seems not to play a significant role.

PP.34.05 HYPERTENSIVE HEART DISEASE AND ARTERIAL STIFFNESS: COMPARISON BETWEEN AUTONOMIC FAILURE AND ESSENTIAL HYPERTENSION

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Objective: Autonomic failure (AF) is characterized by orthostatic hypotension (OH), supine hypertension, high blood pressure (BP) variability, and "reverse-dipping" pattern at 24-hour blood pressure monitoring (24-h ABPM). Patients with AF develop cardiac organ damage and arterial stiffness, similarly to essential hypertension (EH). In previous studies, though, AF patients and EH controls differ in terms of 24h BP load. Aim of the study was to evaluate cardiac organ damage, arterial stiffness, and central hemodynamic in AF, compared with EH controls with a similar 24h BP load.

Design and method: 24 patients with primary forms of AF (5 multiple system atrophy, 6 pure autonomic failure, 12 Parkinson's disease with AF, 1 chronic inflammatory demyelinating polyneuropathy; age 65.8±11.6 years, 25% females), referred to our Unit from 2009 to 2013, were studied. They underwent clinical evaluation, transthoracic echocardiography, carotid-femoral pulse wave velocity (cf-PWV), central hemodynamic, and 24-h ABPM. They were compared to 24 patients with EH matched for age, sex and 24-h mean BP.

Results: Mean 24h BP was similar in AF ad EH (93.8±12.3 vs 94.25±10.27 mmHg, p=0.88). 24-h systolic BP standard deviations were higher in AF than EH (22.97±6.88 vs 14.77±4.93 mmHg, p<0.001). Compared to EH, AF patients had similar left ventricular mass (108.76±32.44 vs 94.53±19.11 g/m2, p=0.08), left atrial volume (37.96±9.46 vs 36.13±14.93 cc/m2, p=0.67), relative wall thickness (0.43±0.06 vs 0.44±0.12, p=0.80), and cf-PWV (9.36±1.96 vs 9.60±2.28 m/s, p=0.70). Compared to EH, AF patients had higher central BP (159.72±29.17/93.89±13.03 vs 132.88±15.89/79.67±9.01 mmHg, p<0.001), pulse pressure (peripheral PP: 78.52±20.83 vs 65.04±11.60 mmHg, p=0.01; central PP: 65.83±21.17 vs 53.21±13.49 mmHg, p=0.01), and augmentation index (35.13±9.26 vs 28.35±11.67%, p=0.03). Pulse pressure amplification ratio was lower in AF than EH (117.35±11.79 vs 127.15±15.24%, p=0.01).

Conclusions: AF patients with supine hypertension and high BP variability develop hypertensive heart disease and increased arterial stiffness. These alterations are confirmed by comparing the results with a group of EH patients matched for age and 24h BP load. Such cardiovascular complications need to be considered when treating OH.

PP.34.06 CARDIOVASCULAR REMODELING IN NEVER-TREATED HYPERTENSIVE PATIENTS: ROLE OF MATRIX METALLOPROTEINASES TISSUE INHIBITOR

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Objective: Hypertension is a major cause of cardiovascular remodeling. It is well known that tissue inhibitors of matrix metalloproteinases (TIMPs) affect extracellular matrix turnover. A recent meta-analysis suggests that TIMP-1 may play a role as a biomarker of cardiovascular remodeling in hypertensive subjects. Aim of our study was to assess in mild hypertensive patients TIMP-1 levels compared to normotensives and to evaluate correlations with cardiac, carotid and renal damage.

Design and method: We enrolled 119 consecutive patients without cardiovascular disease or diabetes, not smokers: 78 were never treated hypertensive patients (mean BP in 24 h >125 and/or 80 mmHg), 41 were normotensive subjects matched for age, sex, body mass index. For each subject we evaluated office and 24 h blood pressure (BP). In each patient we assessed microalbuminuria and renal function parameters. Each patient underwent echocardiography, carotid ultrasonography and arterial tonometry (central BP and pulse wave velocity, PWV).

Results: TIMP-1 values were similar in the two groups (5.18±0.44 vs 5.12±0.41 ng/ml). No correlation was found between TIMP-1 levels and blood pressure (office, 24 h and aortic BP). TIMP-1 values didn't correlate with cardiac remodeling (left ventricular mass, right ventricle free wall thickness, left atrial volume, systolic and diastolic function biventricular parameters), aortic parameters (thoracic aorta diameters, PWV), carotid intima-media thickness (IMT), renal function (microalbuminuria and glomerular filtration rate).

Conclusions: TIMP-1 plasma levels didn't show differences between normotensive and hypertensive patients; we didn't find any correlation between TIMP-1 and markers of subclinical cardiovascular organ damage. TIMP-1 role as biomarker of organ damage in hypertensive patients needs further confirmation from prospective studies.

PP.34.07 RENAL HYPERFILTRATION IN THE HYPERTENSIVE SUBJECT WITH NORMAL SERUM CREATININE: OVERESTIMATION OF THE REAL GLOMERULAR FILTRATION RATE OR INDICATOR OF SUB-CLINICAL RENAL DAMAGE?

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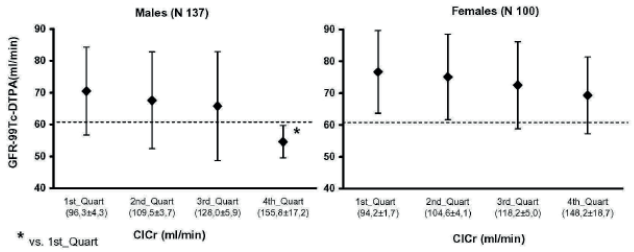
Objective: Although in diabetes renal hyperfiltration (RHF) is a known risk factor for progression to chronic renal disease (CKD), the relationship between RHF, hypertension and CKD is not yet well defined. This is part due to the different definitions of RHF, often assessed as an increase in creatinine

clearance within 24 hours (ClCr in ml/min) and not as a direct measurement of the glomerular filtration rate (GFR).

Design and method: In 237 (58% men) non-diabetics hypertensive subjects (HTs, mean age 55.7±11.1 years), with normal serum creatinine values, consecutively referred to our Hypertension Centre, the GFR was estimated with ClCr and directly measured by radionuclide clearance of Tc99m-DTPA pentetic acid during renal scintigraphy. ClCr was divided into quartiles and the HTs of the 4th quartile were defined to have RHF. Office blood pressure (BP) and 24h-ambulatory BP (ABPM) were measured with Riva-Rocci sphygmomanometer and Takeda TM-2430 device respectively. Albuminuria was detected from a 24h urine specimen. Comparisons between categorical variables were done using the X2 test and the differences between continuous variables were evaluated in both genders by analysis of variance.

Results: Age, body mass index, office BP, ABPM and albuminuria values were not different in quartiles of ClCr in both males and females. Men have than women a significant higher levels of serum creatinine (0.97±0.3 vs. 0.79±0.2, p<0.0001) and ClCr (122.4±24.2 vs. 116.3±22.6, p<0.05) but a lower GFR measured with Tc99m-DTPA (66.8±15.0 vs. 73.4±15.2, p<0.03). In men only the GFR progressively decreased significantly in the quartiles of ClCr (Figure); albuminuria was not different across the ClCr quartiles in both genders.



Conclusions: In the HTs ClCr seems less accurate in identifying the RHF; on the other hand RHF could express a sub-clinical CKD (i.e. GFR <60ml/min) that should be taken into account in the assessment of global cardiovascular risk.

PP.34.08 24-HOUR DIASTOLIC BLOOD PRESSURE AND LEFT VENTRICULAR MASS: IS THERE A "U-SHAPE" RELATIONSHIP?

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Objective: Several studies provide strong evidence for J-shaped relationships between both systolic and diastolic blood pressure (BP) and main outcomes in hypertensive patients, as well as in high risk populations. On the other hand, some authors still dispute the existence of this phenomenon. Aim of our study was to investigate whether systolic and diastolic 24-h BP levels are linearly associated with left ventricular mass (LVM) in hypertensive patients.

Design and method: A total of 972 consecutive subjects referred for evaluation at the Hypertension Unit of our department underwent 24-h ambulatory blood pressure (BP) monitoring and LVM echocardiographic measurements. 688 patients were defined as hypertensives according to the 24-h BP levels (24-h systolic BP>=130 mmHg and/or 24-h diastolic BP>=80 mmHg). Our study population was divided into quartiles in terms of 24-h systolic and diastolic BP. Statistical analysis was performed by means of ANOVA.

Results: According to 24-h BP levels, 688 hypertensive patients were divided into quartiles for systolic Q1s (111-130 mmHg), Q2s (131-135 mmHg), Q3s (136-142 mmHg), Q4s (143-182 mmHg) and diastolic BP Q1d (50-79 mmHg), Q2d (80-83 mmHg), Q3d (84-88 mmHg), Q4d (89-114 mmHg). As far as 24-h systolic BP was concerned, patients of the Q1s presented the lowest LVM index (109 g/m2) followed by Q2s (112 g/m2), Q3s (115 g/m2) and Q4s (128 g/m2). In contrast, 24-h diastolic BP quartiles presented a "U-shape" relationship with LVM index. Patients of Q1d presented significantly higher LVM index (117 g/m2) than those of Q2d (109 g/m2). Additionally, patients of Q4d had significantly higher LVM index (124 g/m2) values than those of Q2d and Q3d (114 g/m2).

Conclusions: Our results demonstrate a "U-shape" relationship between 24-h diastolic BP and LVM index in never treated hypertensive patients.

PP.34.09 NON-DIPPING IS ASSOCIATED WITH INCREASED TARGET ORGAN INVOLVEMENT COMPARED TO DIPPING IN WHITE COAT HYPERTENSIVES

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Objective: Several studies have demonstrated that non-dipping pattern is associated with increased target organ damage involvement and poor cardiovascular outcome compared to dipping pattern in hypertensive patients. However, the role of non-dipping, regarding development of target organ damage, in white-coat hypertensives (WCH) is unclear. Aim of our study was to evaluate the impact of non-dipping on common carotid artery intima-media thickness (CCA-IMT) and left ventricular mass index (LVMI) in WCH subjects.

Design and method: A total of 978 consecutive subjects referred for evaluation at the Hypertension Unit of our department, underwent 24-h ambulatory blood pressure (BP) monitoring, CCA-IMT ultrasonographic and LVMI echocardiographic measurements. Individuals with office BP values >= 140/90 mmHg and daytime BP <135/85 mmHg were defined as WCH. The degree of nocturnal systolic BP (SBP) dipping (%) was calculated as 100[1 – nighttime SBP/daytime SBP ratio]. Dippers were defined as subjects with nocturnal SBP fall >10% and non-dippers as patients with nocturnal SBP fall <10%. Statistical analysis was performed by means of independent-samples T test.

Results: Our study population consisted of 278 WCH patients. Non-dippers (45%) were significantly older and had higher 24-h BP values than dippers (55%). Non-dippers presented significantly higher CCA-IMT (0.77 mm) and LVMI values (116 g/m2) than dippers (0.72 mm), (108 g/m2), even after adjustment for demographic characteristics and baseline risk factors.

Conclusions: Non-dipping pattern is associated with increased CCA-IMT and LVMI values compared to dipping pattern in WCH patients.

PP.34.10 IMPACT OF DIFFERENT TYPES OF MASKED HYPERTENSION ON COMMON CAROTID ARTERY INTIMA-MEDIA THICKNESS

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Objective: It is well known that patients with masked hypertension (MH) have increased target organ involvement and increased cardiovascular morbidity compared to normotensive subjects, and not dissimilar from people with sustained hypertension. However, masked hypertension is not a homogeneous entity. According to the abnormal daytime blood pressure (BP) type (systolic, diastolic and systolic/diastolic), it could be divided into three groups: isolated systolic MH, isolated diastolic MH and systolic/diastolic MH. Aim of our study was to evaluate the impact of the three types of MH on common carotid artery intima-media thickness (CCA-IMT).

Design and method: A total of 1115 consecutive patients referred for evaluation at the Hypertension Unit of our department underwent 24-h ambulatory (BP) monitoring and CCA-IMT ultrasonographic measurements. Patients with normal office BP (<140/90mmHg) and elevated daytime BP values (systolic BP >=135mmHg and/or diastolic BP>=85mmHg) were defined as masked hypertensives. Masked hypertension was diagnosed in 101 subjects, who were divided into three groups according to the type of the abnormal daytime BP: isolated systolic MH, isolated diastolic MH and systolic/diastolic MH. Statistical analysis was performed by means of ANOVA and ANCOVA.

Results: Our study population consisted of 101 masked hypertensives. Patients with isolated systolic MH (36%) were significantly older than those with isolated diastolic (28%) and systolic/diastolic MH (36%). Both groups didn't differ regarding risk factors such as diabetes mellitus, hyperlipidaemia and smoking. Subjects with isolated diastolic MH (0.668mm) presented significantly lower CCA-IMT values than those with isolated systolic (0.777mm) and systolic diastolic MH (0.781mm), even after adjustment for demographic characteristics and risk factors.

Conclusions: Isolated systolic and systolic/diastolic MH is associated with increased CCA-IMT values compared to isolated diastolic MH. The identification of the type of MH may have valuable implication on the risk stratification and treatment of patients with MH.

PP.34.11 PLASMA N-TERMINAL PRO-BRAIN NATRIURETIC PEPTIDE LEVELS AND ARTERIAL HYPERTENSION: CORRELATIONS AND USEFULNESS

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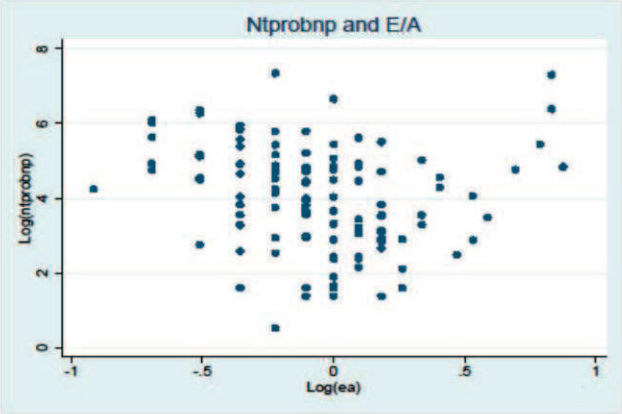
Objective: N-Terminal Pro-Brain Natriuretic Peptide (NT-proBNP) is an important cardiac hormone secreted predominantly by cardiac ventricle as a response to increased wall stress. Plasma NT-proBNP levels increase have been associated with left ventricular hypertrophy and high blood pressure. The aim of this study is to evaluate the NT-proBNP trend in a sample of hypertensive patients.



log NT-proBNP and log E/A correlation

Design and method: We evaluated a sample of 126 patient affected by arterial hypertension (AH), 74 males and 52 females. Any patient had apparent symptoms or signs of heart failure. We evaluated blood pressure, twelve-lead electrocardiography, two-dimensional, M-mode, and colorDoppler echocardiography. Finally all patients was tested with blood sample.

Results: From OLS estimation of five different models of multiple regression, it emerged that while NT-proBNP levels are not explained by left ventricular mass index, they seem to be significantly related to other variables such as left atrial volume and E/A ratio. The relationships of NT-proBNP with age, gender, and Estimated Glomerular Filtration Rate in our sample confirm some literature and empirical evidence.

Conclusions: In asymptomatic hypertensive patients plasma NT-proBNP measurement may be a useful marker of an hypertensive organ damage. This is particularly definite for diastolic dysfunction and to a lesser extent for left atrial volume. The measurement of the plasma concentration of this cardiac hormone might be useful for risk stratification and the management therapy in hypertensive patients.

PP.34.12 RESEARCH OF HYPERTENSION ORGAN DAMAGE: FOCUS ON THE ITALIAN REALITY

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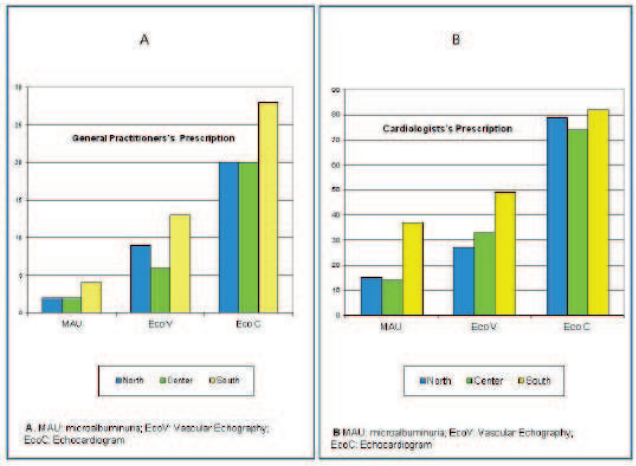
Objective: An appropriate therapeutic management of arterial hypertension expects a comprehensive evaluation of the cardiovascular risk of the patient and an accurate research of the organ damage. In many cases the search for the organ damage is inadequate both in the specialistic and in the general medicine fields.

Design and method: We evaluated 2008 patients from 110 specialistic outpatient facilities over the national territory, in order to evaluate the search of the organ damage before or right after the specialist examination. In addition we stratified the search of the organ damage in accordance with the presence and type of cardiovascular additional risks (diabetes, dyslipidemia, diabetes and dyslipidemia both).



Results: We evaluated 1192 hypertensive patients. The research of the organ damage was more frequent in the specialist field than in the general medicine one. In both cases the research of the cardiac organ damage with echocardiography has a predominant role. The vascular damage evaluated by vascular echography and the renal organ damages evaluated by microalbuminuria have a minor role. This distribution has been confirmed through the stratification of the data for the analyzed risk factors, showing lower levels for the microalbuminuria (14-41%) and higher levels for the echocardiography evaluation (72-91%). This trend is more evident in the northern part of Italy.

Conclusions: The research of the organ damage in hypertensive patients is still inadequate, especially in the general medicine field. The evaluation of the vascular and renal organ damage is not spread yet among both general medical practioners and cardiologists although the microalbuminuria research is very easy and not expensive.

PP.34.13 ELECTROCARDIOGRAPHIC LEFT VENTRICULAR HYPERTROPHY AND ARTERIAL STIFFNESS IN SUBJECTS WITH OR WITHOUT HYPERTENSION: THE HYPERTENSION-DIABETES DAEGU INITIATIVE STUDY

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Objective: Arterial stiffness may contribute to left ventricular hypertrophy (LVH). The aim of this study is to assess whether arterial stiffness [brachial-ankle pulse wave velocity (baPWV)] per se contributes to LVH independently of blood pressure (BP) in subjects with or without hypertension.

Design and method: Study subjects were 1,474 Koreans in a rural area in Daegu city. They were enrolled from August to November 2008 for a cohort study. Of these subjects, 1,430 eligible subjects (528 men; mean age = 63.3 ± 10.6 years-old) were finally analyzed in this study. The baPWV was measured in the supine position after 5 min of bed rest using an automatic waveform analyzer (Colin VP-1000). LVH was diagnosed using electrocardiographic criteria. Study subjects were divided into two groups; LVH (n=304) and non-LVH (n=1,126) groups.

Results: The baPWV was significantly higher in hypertensive individuals compared with prehypertensive and normotensive individuals (1376.9±225.0cm/s versus 1554.7±309.3cm/s versus 1791.4±387.4cm/s, p for trend <0.001). LVH was also more frequently observed in hypertensive individuals compared with prehypertensive and normotensive individuals (12.7% versus 17.4% versus 27.0%, p for trend <0.001). The baPWV was significantly higher in LVH group compared with non-LVH group (1733.4±383.2cm/s versus 1609.9±370.6cm/s, p<0.001). In receiver operating characteristics curves, area under the curve of baPWV for predicting LVH was 0.605±0.017 (sensitivity 78.9%, specificity 40.1%; p<0.001), and optimum cut-off value was 1455.3 cm/s. In multivariate logistic regression model, baPWV >1455.3cm/s (odds ratio [OR] 1.49, 95% confidence interval [CI] 1.03 – 2.16; p = 0.034) in addition to hypertension (OR 1.04, 95% CI 1.01 – 1.07; p = 0.016), male (OR 1.74, 95% CI 1.22 – 2.49; p = 0.002), age (OR 1.02, 95% CI 1.01 – 1.04; p = 0.006), waist circumference (OR 0.96, 95% CI 0.94 – 0.98; p<0.001) was an independent predictor of LVH after adjusting for confounding factors.

Conclusions: Arterial stiffness is independently associated with electrocardiographic LVH in the general population. Our finding suggests that arterial stiffness, together with blood pressure, seems to contribute to the pathogenesis of LVH.

PP.34.14 DIFFERENT TYPES OF ORTHOSTATIC REACTIONS DURING ACTIVE ORTHOSTATIC TEST IN HYPERTENSIVE PATIENTS OF OLDER AGE GROUPS WITH CEREBROVASCULAR DISEASE

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Objective: The aim of our study was to investigate the initial orthostatic reactions (IOR) during active orthostatic test (AOT) in elderly patients (pts) with arterial hypertension (AH) and cerebrovascular disease (CVD).

Design and method: 100 pts (30M, 70F), with AH grade I-III, av.age 68 ±3 years. In all pts, after examining neurologist diagnosed discirculatory encephalopathy I-II, 8 patients had a history of transient ischemic attack, 2 patients had acute ischemic stroke more than a year ago. Pts received regular antihypertensive therapy excluding the administration of drugs at day of the test. During AOT blood pressure (BP) (beat to beat) measured continuously and non-invasively using the Task Force Monitor (CNSystems Austria). IOH criteria was considered the onset of symptoms of cerebral hypoperfusion associated with a reduction in systolic (SBP) > 40 mmHg and / or diastolic blood pressure (DBP) > 20 mm Hg in the first 5-15 seconds orthostasis (Wieling W., 2006) and / or the identification of the initial uncompleted depressor reactions of BP (Rogoza A et al., 2008).The statistical analysis was carried out by nonparametric methods of Mann-Whitney with Statistica 6.0.

Results: At the analysis it is revealed 2 types of the reaction BP. Type I (n=62) observed short-term drop BPah more than 18±8 mm Hg after standing with restoration by 15 sec on 75-100% from an initial level baselend. Type II (n=38) revealed pronounced decrease BP reaction 22±9 mm Hg, but not restoration by 15 sec - initial orthostatic hypotension (IOH). In patients with II IOH was more frequent syncopes (13/62 vs 24/38, p<0,001), was registered higher day DBP [mm Hg] (92±1,9 vs 87,5±1,5, p<0,05). The groups were comparable by left ventricular mass index (II type – 169,9+6,1 vs I type 169,4+5,01; p=0,5).

Conclusions: In elderly patients with arterial hypertension and cerebrovascular disease during active orthostatic test the prolonged initial depressor reactions.

PP.34.15 SUPEROXIDE DISMUTASE MIMETIC IMPROVES KIDNEY FUNCTION AND OXIDATIVE STRESS IN HYPERTENSIVE RATS WITH FOCAL SEGMENTAL GLOMERULOSCLEROSIS

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Objective: Chronic kidney disease is closely linked with oxidative stress and inflammation. The inflammatory cells, as one of the sources of reactive oxygen species (ROS), could be involved in the pathogenesis of focal segmental glomerulosclerosis (FSGS) that is characterized with proteinuria in nephrotic range in most of cases. Further, hypertension is associated with exceeded production of ROS, therefore antioxidant therapies might be beneficial treatment strategies for this disease. The aim of this study was to investigate the effects of tempol (superoxide dismutase mimetic) on kidney function and oxidative stress in spontaneously hypertensive rats (SHR) with adriamycin (ADR)-induced FSGS.

Design and method: SHR females were divided to three experimental groups. Control rats (SHRC) drank tap water by gavage. ADR in dose of 2 mg/kg b.w. (i.v. twice in interval of 3 weeks) was given to two other groups. After the second injection SHRADR group received vehicle, while SHRADR+T group drank tempol (100 mg/kg b.w./day by gavage). After a six weeks treatment period, a urine protein to creatinine ratio (as marker for proteinuria) was determined. The level of oxidative stress was estimated by plasma TBARS as well as antioxidant enzyme activity (SOD-superoxide dismutase, CAT-catalase, and GPx-gluthation peroxidase) in erythrocytes.

Results: Up/cr ratio was increased in SHRADR group compared to SHRC (p<0.001). Tempol treatment significantly lowered this ratio (p<0.001) nearly to the level of control. In adriamycin-induced FSGS lipid peroxidation was significantly increased (p <0.05) and the activity of antioxidative enzymes SOD, CAT and GPx was unchanged compared to SHRC. Chronic application of SOD mimetic, tempol, significantly decreased lipid peroxidation (p<0.05) and induced an increase of the activity of SOD and GPx (p<0.05), while CAT activity was elevated by 36.5% compared to SHRADR group (p=0.059) and it remained unchanged compared to control.

Conclusions: Our results show that treatment with superoxide dismutase mimetic tempol could reduce oxidative stress and improve kidney function in hypertensive rats with adriamycin-induced FSGS.

PP.34.16 COMBINED TREATMENT WITH LOSARTAN AND TEMPOL REDUCES BLOOD PRESSURE AND IMPROVES KIDNEY FUNCTION IN HYPERTENSIVE RATS WITH ACUTE RENAL FAILURE

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Objective: Ischemic acute renal failure is a highly complex disorder characterized by renal vasoconstriction, filtration failure, tubular obstruction, tubular backleak of solutes and generation of reactive oxigen species. Considering this complexity, the aim of our study was to investigate the effects of angiotensin II type-1 receptor blocker - losartan and superoxide anion scavenger - tempol, in combined treatment on ARF in postischemic hypertensive kidney.

Design and method: The experiment was performed in anesthetized, adult six-month-old male spontaneously hypertensive rats (SHR). The right kidney was removed and the renal ischemia was performed by clamping the left renal artery for 40 minutes. SHR were randomly selected in three experimental groups: sham operated rats (SHAM; n=7); ARF control group (ARF; n=7); and ARF group with losartan(10mg/kg/b.w.) and tempol (40 mg/kg/h) combination treatment (ARF+LT; n=9).The combination therapy was given by infusion during the period of three hours after reperfusion. Plasma urea (PUr) and plasma creatinine (PCr) were measured as well as mean arterial pressure (MAP) and renal blood flow (RBF), and renal vascular resistance (RVR) was calculated 24h after reperfusion.

Results:

	MAP (mmHg)	RBF (ml/min/kg)	RVR (mmHg.min.kg./ml)	PCr mmol/l	PUr mmol/l
SHAM (n=7)	147.14±5.84	20.58±4.4	11.32±1.92	0.03±0.003	12.4±1.7
ARF (n=7)	118.33±3.65***	8.03±1.04**	19.90±2.35*	0.24±0.020***	61.9±3.9***
ARF+LT (n=9)	60.2±4.93###$	15.70±2.76#	8.82±2.22##	0.16±0.028##	49.3±6.6#

* p < 0.05; ** p < 0.01; *** p < 0.001 vs. SHAM; # p < 0.05; ## p < 0.01; ### p < 0.001 vs. ARF, n-number of animals

Conclusions: Our results indicate that sinergism of AT1R blockade and superoxid anion scavenging could have beneficial effects on blood pressure and kidney function, during postischemic ARF injury development in hypertension.

PP.34.17 A HIGH-NORMAL ANKLE-BRACHIAL INDEX IS ASSOCIATED WITH ELECTROCARDIOGRAPHY-DETERMINED LEFT VENTRICULAR HYPERTROPHY IN THE GENERAL POPULATION: THE OKINAWA PERIPHERAL ARTERIAL DISEASE

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Objective: We have recently reported that the ABI was lowest at <40 years, increased with age until 60-69 years, and decreased thereafter in the subjects with screened cohort. We hypothesized that ABI increased with age as a result of arterial stiffness, and decreased when flow-limiting atherosclerotic stenosis occurred in the lower limbs. Because arterial stiffness is associated with left ventricular hypertrophy (LVH), we investigate the relationship between ABI and electrocardiography (ECG)-determined LVH.

Design and method: An observational and cross-sectional study was conducted in 13,203 participants aged 21-89 years (53% women) in a health checkup. We measured ABI and brachial-ankle pulse wave velocity (baPWV) by an automatic oscillometric method. LVH was defined by means of the Minnesota code 3.1 and 3.3. ABI was stratified into four groups: ABI <=0.9 (low, n=67); 0.9< ABI <1.0 (borderline-low, n=777); 1.0<= ABI <1.2 (normal, n=11,281); and 1.2<= ABI <1.4 (high-normal, n=1,078). We used logistic analysis to examine the relationship between ABI and LVH, adjusted for age, sex, hypertension, dyslipidemia, diabetes mellitus, low eGFR (<60ml/min/1.73m²), obesity (BMI >=25kg/m²), baPWV, proteinuria, and current smoking.

Results: The prevalence of LVH was 15 %. ABI was higher in participants with LVH than those without LVH (1.12±0.07 vs. 1.10±0.07). The prevalence of LVH was significantly higher in high-normal ABI (25%) and lower in borderline-low ABI (10%) than that of normal ABI (15%). No significant difference was observed between low ABI (15%) and normal ABI. The adjusted odds ratio (OR) for LVH was significantly high in high-normal ABI (OR 1.70, 95% confidence interval (CI); 1.36 to 2.12) and low in borderline-low ABI (OR 0.85, 95% CI; 0.60 to 1.17) in reference to normal ABI. No significant difference was observed in participants with low ABI (OR 1.40, 95% CI; 0.62 to 2.94).

Conclusions: Higher ABI, even within normal ranges, is associated with LVH.

PP.34.18 REEVALUATING CARDIOVASCULAR RISK AT THE LABORATORY

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Objective: We sought to evaluate the effect of assess target organ damage (TOD) on large arteries (intima-media thickness, IMT; carotid-femoral pulse wave velocity, PWV and ankle-brachial index, ABI) on pretest cardiovascular risk stratification according to SCORE function.

Design and method: A prospective study was conducted of 528 consecutive subjects presented at the vascular laboratory in our Hipertensión and Vascular Risk Unit between January 2012 and and December 2012. Following examinations were held: carotid artery ultrasound with intima/media thickness (IMT), carotid femoral PWV by Sphygmocor At Cor® and oscillometric measurement of ABI. Previous cardiovascular risk (CVR) stratification was assessed with SCORE function applying low risk charts.

Results: Those subjects with "white-coat" hypertension, previous cardiovascular disease, diabetes mellitus or secondary hipertensión were excluded so finally we analyzed results from 220 hypertensive subjects. 69% (n: 152) were categorized as low CHD risk (SCORE risk under 3%), 15% (n: 33) as intermediate CHD risk (SCORE risk 3-4%) and 16% (n: 35) as high CHD risk (5% or higher). There were differences between three different groups regarding on age (mean age: 45,9 years old, 63,1 and 65,5 respectively) and gender (% male 45,6%, 69,5% and 81,8% respectively). There were no differences on weight, waist perimeter, body mass index or office blood pressure.
We found TOD on large arteries (9 with IMT > 0,9 mms, 16 with PWV > 12 m/sec and one subject with ABI < 0,9) in 24 subjects at low CHD risk pretest (15.8%), so they were reclassified into high CVR. And we also found TOD (8 with IMT > 0,9 mms, 19 with PWV > 12 m/sec and one subject with ABI < 0,9) in 24 subjects at intermediate CHD risk pretest (72.8%).

Conclusions: These data suggest that more closely assessment of TOD is necessary in order to better CV preventive strategies as it demonstrates improving risk classification, identifying high risk individuals, not detected by SCORE function.

PP.34.19 DISRUPTION OF XANTHINE OXIDOREDUCTASE GENE ATTENUATES RENAL ISCHEMIA-REPERFUSION INJURY IN MICE

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Objective: Renal ischemia-reperfusion (I/R) injury is a major cause of acute renal failure. Reactive oxygen species (ROS) have been implicated as one of the pathophysiological component in I/R injury. Xanthine oxidoreductase (XOR) produces uric acid with concomitant generation of ROS. The aim of this study was to elucidate the role of XOR in renal I/R injury using XOR gene-disrupted (XOR+/-) mice.

Design and method: Both wild type (XOR+/+) and XOR+/- mice were divided into three experiment groups; sham, I/R and I/R treated with allopurinol (I/R+Allo). The I/R group was subjected to bilateral renal ischemia for 30min followed by 24 hours of reperfusion. The I/R+Allo group was treated with allopurinol (0.54mg/day) after ischemia. Renal function was evaluated by blood urea nitrogen, serum creatinine and histology using PAS staining. ROS was examined by the amount of malondialdehyde (MDA) and nitrotyrosine in the kidney. Inflammation was determined by real time RT-PCR of MCP-1 and TNF-α mRNA expression, and immunohistochemical staining of F4/80. XOR expression, activity and distribution in the kidney were evaluated in three groups.

Results: Blood urea nitrogen and serum creatinine concentrations were significantly increased in XOR+/+ I/R mice; however, these blood variables were significantly less increased in XOR+/- I/R and XOR+/+ I/R+Allo mice compared to XOR+/+ I/R mice. Histological analysis revealed that tubular injury such as cast formation and tubular dilatation were attenuated in XOR+/- I/R and XOR+/+ I/R+Allo mice compared to XOR+/+ I/R mice. The amount of MDA and nitrotyrosine, the number of F4/80 positive cells, and the expression of MCP-1 and TNF-α mRNA in the kidney were also decreased in XOR+/- I/R and XOR+/+ I/R+Allo mice compared to XOR+/+ I/R mice. Immunohistochemical staining showed that XOR was mainly expressed on the intima of blood vessels and peritubular capillary in the kidney. Both XOR expression and activity were significantly increased after renal I/R.

Conclusions: Both disruption of XOR gene and suppression of XOR activity in I/R model mice decreased ROS generation and reduced renal tissue injury. These results suggest that XOR promotes renal I/R injury via oxidative stress.

PP.34.20 DIFFERENTIAL VALUE OF LEFT VENTRICULAR MASS INDEX AND WALL THICKNESS IN PREDICTING CARDIOVASCULAR PROGNOSIS: DATA FROM THE PAMELA POPULATION

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Objective: Data on the prognostic value of echocardiographic left ventricular hypertrophy (LVH) as defined by LV wall thickness rather than LV mass estimate are scanty and not univocal.
Thus, we investigated the value of LV mass index, wall thickness and relative wall thickness (RWT) in predicting cardiovascular events in the PAMELA population.

Design and method: At entry 1716 subjects underwent diagnostic tests including laboratory investigations, 24-hour ambulatory blood pressure (BP) monitoring, and echocardiography. For the purpose of the present analysis all subjects were divided into quintiles of LV mass, LV mass/BSA, LV mass/h2.7, interventricular septum (IVS), posterior wall (PW) thickness, IVS+PW thickness, and RWT.

Results: Over a follow-up of 148 months, 139 non-fatal or fatal cardiovascular events were documented. After adjustment for age, sex, BP, fasting blood glucose, total cholesterol, and use of antihypertensive drugs, only the subjects stratified in the highest quintiles of LV mass indexed to BSA or height2.7exhibited a greater likelihood of incident cardiovascular disease: relative risk 2.69 (CI:1.05-6.96, p=0.04) and 4.62 (CI 1.42-15.02, p=0.01), respectively, as compared to the first quintile (reference group). The same was not true for the highest quintiles of IVS, PW thickness, IVS+PW thickness and RWT. Similar findings were found when echocardiographic parameters were expressed as continuous variables.

Conclusions: The present study indicates that LV wall thickness, at difference from LV mass index, does not provide a reliable estimate of cardiovascular risk associated with LVH in a general population. From these data it is recommended that echocardiographic laboratories should provide a systematic estimate of LV mass index, which is a strong, independent predictor of incident cardiovascular disease.

PP.34.21 24 HOURS AMBULATORY BLOOD PRESSURE MONITORING (ABPM) IN HYPERTENSIVE PATIENTS WITH AORTIC ANEURYSMS: A CASE-CONTROL STUDY

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Objective: To analyze the clinical features of 24 hours (h) ABPM in treated hypertensive patients with aortic aneurysms (AA).

Design and method: In a cross-sectional, case-control study, we compared 116 treated hypertensives with AA [abdominal (56%), thoracic (32,7%) and thoraco-abdominal (11,3%)] versus 100 controls matched for age (67±14 vs 65,8±12 years), sex (87,7 vs 85% males), office BP(143±18/78±14 vs

149±15/78±10 mmHg), duration of hypertension (15±9 vs 16,3±10 years), and vascular risk profile [associated VRFs (%): type 2 DM 18,8 vs 20), dyslipidemia (58,7 vs 50), obesity (45,6 vs 43) and smoking (58 vs 52)] and vascular complications (%) [stroke (15,2 vs 17), IHD (ischemic heart disease) (21 vs 19), CKD (chronic kidney disease) (31,3 vs 33) and PVD (peripheral vascular disease) (18,8 vs 16)]. Average antihypertensive agents (3,6±2 vs 3,4±1) with predominance of RAS (renin-angiotensin system) blockers (87 vs 90). A 24 h ABPM was performed in all patients.

Results: 24 h ABPM values (cases vs controls): mean BP (mmHg) 24h (115±69 vs 119±70), daytime (116±71 vs 120±72; p <.01) and nigthtime (116±67 vs 110±60; <.05). Degree BP control (%): 24 h (65,2 vs 64), daytime (67,4 vs 73) and nighttime (45 vs 77; <.01). Nocturnal intrinsic BP variability (mmHg): systolic (12,4 vs 8,4; <.03), diastolic (8,8 vs 3,9; <.04). Nocturnal BP load (%): systolic (36,5 vs 8,4; <.001), diastolic (15 vs 3,6; <.005). Abnormal circadian BP pattern (%): 78,9 vs 45 <.004, non-dipper (49,7 vs 39; <.002), riser (29,2 vs 5; <.008) and extreme dipper (3,1 vs 1; <.07). AA vs controls showed more risk (OR (95%CI) for: abnormal circadian pattern (4,4 (2,6-7,7); nocturnal systolic BP load greater than 40% (8,1 (5,1-10,2) and nocturnal diastolic BP intrinsic variability > 10 mmHg (4,2 (3,3-5,9; <.02).

Conclusions: Compared with matched controls, hypertensives patients with AA showed a significantly worse nocturnal BP profile (with a poorer control and higher mean levels of systolic and diastolic BP; intrinsic BP variability and BP loads), as well as non dipper and riser BP patterns. These parameters clearly seem to contribute to the aortic wall degeneration and development of the AA.

PP.34.22 RENAL VOLUME IN AUTOSOMAL DOMINANT POLYCYSTIC KIDNEY DISEASE PATIENTS IS ASSOCIATED WITH AN INCREASE IN BP AND ASYMPTOMATIC ORGAN DAMAGE BEFORE THE DEVELOPMENT OF HYPERTENSION

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Objective: Arterial hypertension is highly prevalent in autosomal dominant polycystic kidney disease (ADPKD) patients and target organ damage is more prevalent than in their age-matched essential hypertensive patients. Recently, total renal volume has been proposed as a marker for disease severity and progression having the worst prognosis those ADPKD patients with the greatest renal volume. We aimed to determine whether ultrasonographic kidney volume correlates with both peripheral (24h-ABPM) and central (aortic) BP and with asymptomatic organ damage (AOD).

Design and method: 62 ADPKD patients aged 34±8.5 years (59.7% women) were included. Renal ultrasound, 24h-ABPM, aortic BP (assessed by radial applanation tonometry), carotid-femoral pulse wave velocity (cfPWV), echocardiography, ankle-brachial index, carotid intima-media measurements and laboratory analyses were determined in all patients.

Results: Total kidney volume was 804.0±430.5 ml. Mean± SD values of 24hABPM (mmHg) data were: day SBP 120.7±12.1 mmHg, day DBP 79.8±8.4, night SBP 106.8±11.8 and night DBP 66.5±7.0. Aortic BP was: SBP 109.5±13.4 mmHg and DBP 76.7±9.2. AOD results were: left ventricular mass index 90.9±17.7 g/m2, left ventricular remodelling index (LVRI) 0.372± 0.064, carotid intima-media thickness 0.53±0.09 mm, cfPWV 6.8±1.1 m/s, ankle-brachial index 1.16±0.1(right) and 1.21±0.4(left), estimated glomerular filtration rate (CKD-EPI) 105.1±14.7 ml/min/1.73m2 and albumin-creatinine ratio (median [IQR]) 10,16 (5,89-21,01) mg/g. Correlations between total kidney volume and both BP levels and AOD were assessed by means of correlation coefficients (Rho Spearman).Total kidney volume significantly correlated with day SBP (0.305*), day DBP (0.416**), night DBP (0.367**), aortic SBP (0.366**), aortic DBP (0.402**), LVRI (0,284*), cfPWV (0,366**) and albumin-creatinine ratio (0.494**) (*p<0,05) (**p<0.01).

Conclusions: In our APPKD population larger kidney volume is associated with higher BP level and AOD in kidney, heart and great vessels before the development of arterial hypertension. Therefore, it seems essential in normotensive ADPKD to look for AOD in patients with enlarged kidneys. Early diagnosis and treatment of AOD will improve cardiovascular and renal complications in ADPKD.

PP.34.23 RIGHT VENTRICULAR WALL THICKNESS AND ACTIVITY OF SODIUM/HYDROGEN EXCHANGER IN YOUNG POPULATION WITH ESSENTIAL HYPERTENSION

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Objective: The present study was projected to analyze the wall thickness of right ventricle (RV) and its relationship with the sodium/hydrogen exchanger (NHE) activity in thrombocytes as no hemodynamics signal, over a young population with essential arterial hypertension (HT).

Design and method: 750 medical students (20.48± 0.07 years old) for La Plata School of Medicine were included in the study. 47 were HT indicating a prevalence of 6%. These 47 HT and 45 normotensive (NT) randomized of the general population configured our reference group. LV mass index (LVMI) and RV wall thickness (RVWT) was obtained, to characterized ventricular structure, by echocardiographic study. In 24/47 students (13 HT, 11 NT) it was determined in thrombocytes, by a sample of blood of peripheral vein, the velocity of intracellular pH (pHi) recuperation as expression of NHE activity.

Results: LVMI was higher in HT group (HT: 77.07 ± 2.21g/m2; NT: 69.36 ± 2.02 g/m2 p<0.01) as an answer to pressure overloading. The RVWT also was higher in HT (HT: 4 ± 0.05 mm; NT: 3 ± 0.06 mm- p< 0.01), showing a modification of RV structure in HT. On the other hand the HT had a higher velocity of pHi recuperation after an acidify pulse, pointing the increase NHE activity in the thrombocytes, respect to NT (HT: 0.32 ± 0.03 Ph/s, NT: 0.24 ± 0.01Ph/s p<0.03).

Conclusions: Analyzing the results we conclude that in this young population the increases of blood pressure produced structural changes in LV represented for the increase in LV mass and in RV as showed by the increment in wall ventricular thickness. As the higher expression and activity of NHE was associated with the intracellular pathway to produce hypertrophy, the finding that the NHE had more activity in trombocyte in our observation, allow as to inferring that this activity could be increment in the RV muscle fibers and would be responsible of the non hemodynamic answer of the RV in systemic hypertension.

PP.34.24 PULSE WAVE VELOCITY PREDICTS LEFT VENTRICULAR GEOMETRIC ALTERATIONS IN CHRONIC KIDNEY DISEASE PATIENTS

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Objective: Cardiovascular (CV) diseases are the main cause of death in chronic kidney disease (CKD) patients. Among several CV risk factors, arterial stiffness takes a primary role in those patients, and its early non invasive measurement could give a better stratification of their CV risk. The aim of our study was to explore the relation between arterial stiffness and cardiac damage, evaluated using Pulse Wave Velocity (PWV), and Left Ventricular Hypertrophy (LVH) or remodeling (LVR) respectively.

Design and method: 40 patients with CKD stage 2-4 NKF-KDOQI (mean age 67,55 ± 7,54, mean eGFR 33±17,52 ml/min), after physical examination, anthropometric and biochemical measurements, were undergone to office and 24h ambulatory blood pressure (BP) and 2D color Doppler echocardiography. Then, they were divided in two groups according to the presence (Group A) or the absence (Group B) of echocardiographic LV geometric alterations (LVH and LVR as defined in the current ESH guidelines), and femoral PWV was measured by applanation tonometry.

Results: Group A (19 patients) and B (21 patients) showed similar values of serum Creatinine (2.84 vs. 2.39 mg/dL, p=0.2) and 24h systolic (132 vs. 134 mmHg, p=0,63), diastolic (71 vs. 79 mmHg, p=0.1) and mean (94 vs. 98 mmHg, p=0.69) BP. Moreover, cfPWV resulted significantly higher in Group A than in Group B (15,392 vs 11.476 m/s p=0.0003).

Conclusions: This study shows that in patients with CKD, cfPWV is correlated with LV geometric alterations. cfPWV is a standardized, reproducible and easy to obtain marker of large artery stiffening, and can be measured noninvasively. In patients with CKD, cfPWV can be used to identify patients with LV alterations, in order to better stratify their CV risk.

PP.34.25 PULSE WAVE VELOCITY HAS DIFFERENT PATTERNS OF ASSOCIATION WITH SUBCLINICAL CARDIAC DAMAGE IN HYPERTENSIVE PATIENTS WITH OR WITHOUT CHRONIC KIDNEY DISEASE

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Objective: Different patterns of left ventricular mass index (LVMI) are associated with a variable cardio-vascular risk profile. In essential hypertensives (EH) as well as among hypertensives with chronic kidney diseases (CKD-H) arterial stiffness (AS) is associated with LV hypertrophy and stiffening. We investigated the correlations between pulse wave velocity (PWV), an index of AS, LVMI and left ventricular geometry in EH and CKD-H individuals.

Design and method: 84 patients were evaluated, 40 with established CKD stage 2-4 (CKD-H, mean age 67,55 ± 7,54, mean eGFR 33±17,52 ml/min) and 44 without evidence of CKD (EH, mean age 64,1± 9,3, mean eGFR 74 ± 16,82). Each patient underwent physical examination, anthropometric, biochemical measurements, office and 24h ambulatory blood pressure (BP) measurement in order to estimate their cardiovascular risk using SCORE chart. Pulse Wave Velocity (PWV) and central BP values were assessed by applanation tonometry. Left ventricular geometry and function was assessed by 2D color Doppler echocardiography.

Results: General anthropometrics, bio-humoral charachteristics (except eGFR) and overall CV risk (CKD-H SCORE 7±3,1%, EH SCORE 6,7±2,3%, p=ns) were not statistically different in the two groups. CKD-H showed higher PWV respect to EH (12,660±4,83 m/s vs. 10,165±3,7, p<0,001) . Despite similar blood pressure control CKD-H had higher LVMI (105,58±19,3 g/mq vs. 17,77 g/mq, p<0,05) respect to EH. Furthermore, CKD-H showed a stronger correlation beteween indices of arterial stiffness and several parameters of ventricular dysfunction (shown in Table).

	CKD-H	EH
LVMI and PWV	r=0,19*	r=0,06
RWT and PWV	r=0,36*	r=0,2*
LVMI and AIx	r=0,16*	r=0,08
E/A and PWV	r=0,47*	r=0,33*

* p<0,05; LVMI Left Ventricular Mass Index for BSA; RWT Relative Wall Thickness; AIx Augmentation Index;

Conclusions: Our results suggest that among CKD-H individuals arterial stiffness is associated with worse left ventricular patterns than among patients with EH. Moreover, our results suggest a greater stiffening of LV and vessels in CKD patients, with greater correlation between AS parameters and LVM in this population. Therefore we suggest that AS should be routinely evaluated among CKD-H in order to stratify their CV risk profile.

PP.34.26 RENAL DAMAGES IN PATIENTS WITH RESISTANT HYPERTENSION

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Objective: To assess the relationship between subclinical renal damage and the values of BP in ambulatory patients with resistant hypertension (RHTN).

Design and method: We examined 336 ambulatory patients with uncontrolled HTN (UCHTN) (94 males and 242 females) 39 – 69 (the mean age 54±3) years old on a combined antihypertensive therapy. The repeated "office" blood pressure (BP) measurements, ambulatory BP monitoring (ABPM) were performed in all patients. Patients were screened for secondary HTN. 24 hours microalbuminuria (MAU) was estimated by immunofluometric method with monoclonal antidodies (Sigma Oldrige). Baseline plasma creatinine concentration and glomerular filtration rate (GFR) were calculated by MDRD formula.

Results: The secondary HTN was diagnosed in 29 (8,6%) cases. In 45 (13,4%) patients obstructive sleep apnea was revealed, 21 (6,3%) patients had "white-coat" HTN.
In 195 cases (59,1%) the main cause of RHTN was suboptimal treatment regimen. In this group "office" BP decreased significantly from 167±8/98±5 mm Hg to 134±4/86±2 mm Hg (P<0.001) during 3-monts of follow-up.
Thus, "true" RHTN was found in 46 patients (13,7%). Baseline plasma creatinine concentration was higher compared with age-matched patients with uncontrolled UCHTN who achieved goal BP during treatment modification period: 99±7 µmol/l vs 84±9 µmol/l , P<0.05. The plasma creatinine concentration closely correlated with age (r=0.49, P<0.05), 24 hours average systolic BP (r=0,61, P<0.01), baseline "office" systolic BP, (r=0,61, P<0.01). No significant correlations were found in subjects defined as UCHTN. Also we found negative correlation between changes "office" systolic BP during therapy and plasma creainine values (r=-0.46, P<0.05) in "true" resistant group.
Calculated GFR in RHTN was lower compared to age-matched patients with UCHTN (54±7vs 68±12ml/min/1,73 m2). In RHTN MAU was found in 37 cases (80,4%) (P<0,01) and only in 9 cases (20%) age-matched patients with UCHTN.

Conclusions: The "true" resistance is a relatively rare condition among UCHTN. "True" treatment resistance is closely associated with kidney damage. This association can be a marker of a kidney as a target for BP as well as a sign of causative relation of renal impairment with treatment resistance.

PP.34.27 SMOKING INFLUENCES A LEVEL OF CYSTATIN C IN ESSENTIAL HYPERTENSIVE PATIENTS

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Objective: Cystatin C is commonly used to estimate renal function. The aim of our study was to evaluate Cystatin C levels in the essential hypertensive patients (EH pts) depending on the factor of current smoking.

Design and method: 47 EH pts (30M, 17F) grade 1 or 2, av. age 46,0±1,8 years with short duration EH (no more 5 years) and without chronic kidney disease (Creatinine level: 84,7±1,9 µmol/L, Glomerular filtration rate (GFR): 114,9±5,4 ml/min), 24-h SBP was 139,7±1,8mm.Hg., 24-h DBP was 84,8 ±1,7 mm Hg. Cystatin C was defined by a method of turbidimetry on the Architect C 8000 analyzer (Abbot, USA). High-sensitivity CRP was defined by a method of turbidymetry. Uric albumin excretion (UAE) was defined by a turbidimetry method. Uric acid in urine (UAU) (N -1,48-4,43 mmol/day) was defined by a UF method on the uricase selective analyzer. GFR was calculated by the MDRD formula. The statistical analysis was carried out by nonparametric methods of Mann-Whitney with STATISTICA 10. The data is presented as M±SE.

Results: In the current smoker's group significant Cystatin C level was found. UAE, UAU, GFR and CRP levels were not different in both groups EH pts (Table).

Parameters	Current Smokers group (n=19)	Non smokers group (n=28)	P, value
Cystatin C (µg/L)	1,02±0,02	0,92±0,03	p=0,01
UAE (mg/day)	18,4±3,8	18,6±4,9	n/s
UAU (mmol/day)	4,9±1,5	4,3±1,1	n/s
GFR (ml/min)	115,1±6,8	113,9±8,4	n/s
CRP (mg/L)	3,9±1,8	3,8±0,9	n/s

Conclusions: Cystatin C is a potent nonorgan-specific cysteine protease inhibitor and may contribute to elastolysis and tissue destruction. Our results suggest that Cystatin C may play a role in the pathogenesis of smoking related emphysema in the EH pts.

PP.34.28 PREVALENCE OF ESTABLISHED CARDIOVASCULAR DISEASE AND HYPERTENSION IN A ROMA ETHNIC COMMUNITY: OLD DISEASES IN YOUNGER PATIENTS? DATA FROM THE ROMA STUDY

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Objective: Previous studies on the Roma ethnic community have suggested a higher burden of cardiovascular (CV) disease. We aimed at assessing the prevalence of established CV disease in this particular ethnic group, focusing on the age as a marker of earlier onset of CV pathology.

Design and method: 406 adult subjects (age range 18-82 years) from two urban Roma communities were included, regardless of medical history, and screened for major CV risk factors and CV disease. We recorded: demographic and anthropometric data, presence of major cardiovascular (CV) risk factors and blood pressure measurements with appropriately sized cuffs, presence of peripheral

arterial disease (ankle-brachial index < 0.9 in either limb) and history of myocardial infarction, stroke, and heart failure. Diabetes mellitus was either known or newly diagnosed by measuring fasting plasma glucose (diabetes was considered with blood glucose levels > 126 mg/dL).

Results: In this group of 406 enrolled subjects, 142 were known or newly diagnosed hypertensives (34.9%), with a percentage of 63.3% females. Forty-six percent of patients were smokers (41.2% females and 54.5% males). For a full description of the established CV disease prevalence, mean age of the patients and associated HTN see table.

	F	M	p (F vs M)	Total
Arterial hypertension, No (%)	90(63.38%)	52(36.61%)	0.01	142(100%)
Average age	56±11.26	56±10.56	ns	56±10.97
Myocardial infarction, %	5.55%	25%	0.01	12.67%
Average age	62±6.76	55±10.11	ns	57±9.7
Stroke, %	8.88%	11.53%	ns	9.8%
Average age	62±7.24	62±10.94	ns	61±9.24
Heart failure, %	7.77%	19.23%	0.01	11.97%
Average age	59±5.49	62±7.89	ns	61±6.39
Peripheral artery disease, %	46.6%	50%	ns	47.88%
Average age	48±13.88	46±16.41	0.05	47±14.88
Diabetes mellitus, %	30%	23.07%	ns	27.46%
Average age	56±9.45	57±7.41	ns	56±8.81

Conclusions: In the Roma ethnic community there is a high prevalence of hypertension affecting more women than men. Moreover, established CV disease such as myocardial infarction, heart failure, stroke and peripheral artery disease seems to appear at a much younger age compared to the prevalence reported for the general population in literature. Peripheral artery disease in particular has a high prevalence, which probably relates to the impressive percentage of smokers and dyslipidemics in the Roma population.

PP.34.29 HYPERTENSIVE CARDIAC ORGAN DAMAGE IN THE ROMA ETHNIC COMMUNITY: AN ECHOCARDIOGRAPHIC STUDY. DATA FROM THE ROMA STUDY

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Objective: Left-ventricular hypertrophy (LVH) is a cardinal manifestation of hypertensive (HTN) organ damage associated with an increased cardiovascular (CV) risk. We aimed to assess the prevalence of LVH using echocardiography in the hypertensive group of a Roma ethnic community in order to evaluate the magnitude of subclinical LV alteration.

Design and method: Four hundred and six adult subjects (age range 18-83 years) from the Roma urban community, regardless of medical history, were included. We recorded demographic and anthropometric data, presence of major cardiovascular risk factors and blood pressure was measured with appropriately sized cuff. Obesity was graded according to body mass index (BMI) and obesity was defined as BMI > 30 kg/m2. LV mass (LVM) was calculated using the Devereaux formula and indexed to body surface area (LVMI). LVH was defined as LVMI higher than 95 g/m2 in women and 115 g/m2 in men. Relative wall thickness (RWT) was used to define concentric (RWT > 0.42) or eccentric (RWT <= 0.42) hypertrophy.

Results: In this group, 142 subjects (34.9%) were known or newly diagnosed HTN patients, with a proportion of 63.3% women. The prevalence of LVH in this hypertensive population was 46.4% (40.3 % in the male and 50.0% in the female population, p 0.01). Concentric LVH was the predominant type (87.7%). For a comparison of associated CV risk factors between LVH and non-LVH patients see table.

HTN population	LVH	Non-LVH	p
Female, %	67.1	32.9	-
Average age (years)	58.0±10.7	54.2±10.8	0.03
Mean LVMI, g/m2	124.3±23.1	78.8±18.4	0.00
Uncontrolled HTN	62.8	26.3	0.00
Smoking, %	34.2	58.5	0.00
Obesity (BMI>30 kg/m2), %	61.4	44.4	0.01
Hypercholesterolemia (≥190mg/dl), %	63.8	57.1	0.20
Diabetes mellitus, %	24.2	15.2	0.06

Conclusions: In the hypertensive patients from the Roma ethnic community there is a high prevalence of cardiac organ damage as reflected by LVH. Women tend to be more affected than men. Patients with LVH are older, more frequently obese, have uncontrolled HTN and a higher proportion of diabetic patients. Strangely, smoking was less frequent in the LVH than in the non-LVH group. Our analysis calls for a more aggressive treatment of HTN and clinical correlates in this ethnic group.

PP.34.30 ASYMPTOMATIC TARGET ORGAN DAMAGE IN THE ROMA HYPERTENSIVE POPULATION: 'THE PICTURE' IN AN ETHNIC COMMUNITY. DATA FROM THE ROMA STUDY

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Objective: It has been proven that Roma ethnic community suffers from severe cardiovascular (CV) disease at an earlier age. Asymptomatic target organ damage (TOD) is an intermediate step in the development of CV disease and is an important marker of overall CV risk. Therefore, we aimed at assessing the TOD damage in the Roma hypertensive population.

Design and method: Eight hundred and six adult subjects (age range 18-83 years) from the Roma urban community, regardless of medical history were included in the study between 2012 and 2013. For each subject, we recorded demographic and anthropometric data, presence of major cardiovascular risk factors and blood pressure measurements done with appropriately sized cuffs. TOD was assessed in hypertensive subjects according to guidelines recommended parameters: left ventricular hypertrophy (LVH) was defined on echocardiographic studies using LV mass index calculated with the Devereaux formula, peripheral arterial disease (PAD) based on the ankle-brachial index (ABI < 0.9 in either leg), arterial stiffness based on pulse wave velocity (PWV) over 10 m/s, microalbuminuria on dipstick and glomerular filtration rate (eGFR) was estimated using CKD-EPI study equation while chronic kidney disease stage >3 was considered at eGFR <60ml/min/1.73m2.

Results: In this urban Roma population, the prevalence of arterial hypertension was 33.6% (271 patients). For results from the TOD screening see table.

Population characteristics	Males	Females	p (M vs F)	Total
Arterial hypertension, No (%)	99 (36.53%)	172 (63.46%)	ns	271(100%)
Average age (years), No ± SD	55.26±10.07	56.18±11.32	ns	55.84±10.87
LV Hypertrophy, %	47.47%	45.93%	ns	46.49%
Ankle brachial index<0.9, %	52.53%	52.91%	ns	52.77%
Pulse pressure>60 mmHg, %	52.53%	53.48%	ns	53.13%
PWV> 10 m/s, %	68.68%	73.25%	ns	73.06%
CKD (eGFR<60 ml/min/1.73m2), %	3.03%	8.14%	ns	6.27%
Microalbuminuria, %	12.12%	22.09%	0.04	18.45%

Conclusions: In the Roma population, women are more affected by hypertension. The burden of TOD is very high in this population and it starts at an early age. Both sexes seem to be affected equally except for microalbuminuria, which was more prominent in women.

PP.34.31 ECHOCARDIOGRAPHIC AORTIC ROOT DILATATION IN HYPERTENSIVE SUBJECTS: A SYSTEMATIC REVIEW AND META-ANALYSIS

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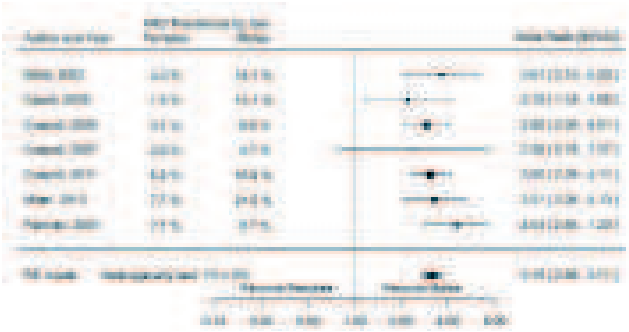
Objective: The risk of thoracic aortic dissection is strictly related to the diameter of the ascending aorta. Arterial Hypertension represents a major risk factor for the development of aortic dissection and is thought to be directly involved in the pathogenesis of aortic aneurysms. Recent studies have suggested a high prevalence of aortic root enlargement in the hypertensive population, but evidence of a direct link between blood pressure values and size of the aortic root has been inconclusive so far. The aim of the current study was to evaluate prevalence of aortic root dilatation (ARD) in the hypertensive population and to assess the correlates of this condition.



Design and method: Medical literature was reviewed to identify articles assessing prevalence of echocardiographic ARD in hypertensive patients. In order to be considered eligible, the following data had to be reported: 1) prevalence of echocardiographic ARD; 2) definition of ARD; 3) details concerning the measuring technique and the anatomical level at which the aortic root was assessed; 4) inclusion of subjects affected by hypertension defined according to current guidelines; 5) publication in peer-reviewed journals. We conducted a computerized search using PubMed, OVID and ISI-Web of Knowledge databases from their inception through October 7, 2013. Random-effect (RE) models were used due to high heterogeneity of the study samples.

Results: A total of 8 studies including 10791 hypertensives were considered. Prevalence of ARD in the pooled population was 9.1% with a marked difference between men and women (12.7% vs. 4.5%; odds ratio 3.15; 95% C.I. 2.68-3.71). Hypertensives with ARD and those with normal aortic root size had similar office BP values but the former were older and had a significantly higher left ventricular mass (0.52 SDs, 95% C.I. 0.41-0.63).

Conclusions: ARD is a common phenotype in hypertensive subjects, with males showing a markedly higher susceptibility, but office blood pressure values do not appear to be directly associated with aortic root diameter. The role of other mechanisms such as hormonal factors should be investigated. The protective influence of female sex deserves further elucidation as well.

PP.34.32 THE DYNAMIC RESPONSE OF NT-PROBNP TO CIRCADIAN RHYTHM IS RELATED TO CARDIOVASCULAR REMODELING

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Objective: NT-proBNP is a powerful predictor for mortality in hypertension. NT-proBNP varies during the day because of blood pressure (BP) variations or blood volume changes. This variability may reveal some characteristics of the cardiovascular system. A likely feature of a satisfactory cardiovascular system is probably to accommodate to hemodynamic changes with a limited impact on NT-proBNP. On the contrary, an increase of NT-proBNP variability may reflect an impaired cardiovascular system. Thus the aim of the present study was to determine the link between NT-proBNP variability in comparison to baseline NT-proBNP with target organ damages.

Design and method: While the 24-hour BP recording was in progress, NT-proBNP was measure twice in 169 hypertensive patients: 1) during the daytime period (DT), 2) at the end of nighttime period (NT). NT-proBNP variability was defined as DT-NT values. During the hospital stay, patients also had an ECG and a pulse wave velocity (PWV) measurement.

Results: Baseline characteristics were as follows: 53.3% of men, mean age 45 ± 16 years, mean 24-hour BP 140 ± 21/87 ± 12 mmHg and mean NT NT-proBNP 60 ± 261 pg/mL. NT NT-proBNP was correlated with PWV (r=0.484, p<0.001) and R wave in aVL (RaVL) lead (r=0.209, p=0.034) but not with microalbuminuria (r=0.145, p=0.110).NT-proBNP variability was also associated with PWV (r=0.261, p=0.005), RaVL (r=0.318, p=0.001) and a trend was observed with microalbuminuria (r=0.164, p=0.07). After adjusment for NT NT-proBNP and 24-hour systolic BP, NT-proBNP variability was still correlated with RaVL(r=0.312, p=0.002) but not with PWV and microalbuminuria. Conversely, after adjustment for NT-proBNP variability and 24-hour systolic BP, NT NT-proBNP was still associated with PWV (r=0.329, p<0.001) but not with RaVL and microalbuminuria.

Conclusions: NT-proBNP variability and basal values are associated with different target organ damages. While variability is more related to left ventricular hypertrophy, basal NT-proBNP values are mostly associated with vascular damages. Thus, the variation of NT-proBNP during the day could reflect the adaptive capacity of the cardiovascular apparatus and may be more capable to detect subtle dysfunctions than basal assessment particularly in the presence of mild symptoms unexplained by parameters at rest.

PP.34.33 R WAVE IN AVL LEAD IS SUFFICIENT TO DETECT LEFT VENTRICULAR HYPERTROPHY IN WOMEN AND IN PATIENTS WITHOUT HEART FAILURE

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Objective: Detection of left ventricular hypertrophy (LVH) by ECG is crucial for risk stratification in hypertension. R wave in aVL lead (RaVL) seems better correlated than other ECG indexes with left ventricular mass index (LVMI) measured by transthoracic echocardiography in patients free from overt cardiac diseases. The aim of the present study was to address specific conditions (gender, BMI, conduction disorder, heart disease) that may modify the performance of RaVL in comparison to LVMI measured by cardiac MRI (CMR).

Design and method: In a cohort of 356 patients with various clinical conditions, LVMI was assessed with CMR. The LVH cut-off values were 83 g/m2 in men and 67 g/m2 in women. ECG was performed during the same week and several parameters analyzed including RaVL. Statistical analyses were performed with ROC curves and linear regression analysis.

Results: In the whole cohort, LVMI was statistically correlated with QRS length (r=0.276, p<0.001), SV1 (r=0.242, p<0.001), SV3 (r=0.401, p<0.001) and RaVL (r=0.359, p<0.001). The areas under the ROC curve (AUC) in diagnosing LVH were 0.756 for SV3, 0.755 for RaVL, 0.600 for Sokolow index, 0.828 for Cornell Voltage and 0.821 for Cornell Product (p for difference <0.001). In women (N=132), RaVL was the best index correlated with LVMI (r=0.429, p<0.001) and AUC was quite similar than that obtained for Cornell Voltage and Cornell Product (0.792, 0.801, 0794, respectively, p for difference 0.777). The same good accuracy of RaVL to detect LVH was observed in patients with right bundle branch block (N=60, r=0.394, p<0.001, AUC = 0.853), in patients without heart failure (N=190, r=0.486, p<0.001, AUC=0.784) and in those with BMI >30kg/m2 (N=55, r=0.502, p<0.001, AUC=0.854). Optimal cut-off value of RaVL to detect LVH was always >8 mm and the number of patient correctly classified ranged from 75 to 88%.

Conclusions: Our results confirmed that RaVL is a good index of LVH assessed with cardiac MRI. Its diagnostic performance seems sufficient to use it alone to diagnose LVH in women, in patients with right bundle branch block or obesity and in those without heart failure.

PP.34.34 METALLOPROTEINASE 9 LEVELS OF EXTRACELLULAR MATRIX ARE INCREASED IN PREHYPERTENSIVE INDIVIDUALS

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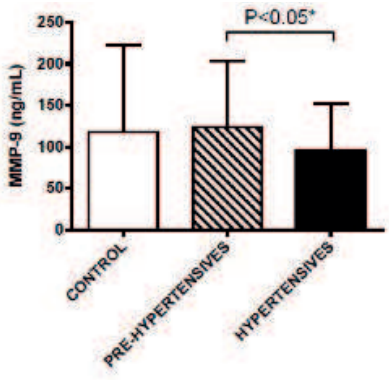
Objective: Vascular remodeling is one of the pathophysiological mechanisms that characterize hypertension. Thus, there is interest in the study of proteolytic enzymes known as matrix metalloproteinases (MMPs), which are responsible for degradation and reorganization of the matrix of the vessel wall. The activity of MMPs can be regulated by several mechanisms, including induction of gene transcription, post-translational modification and interaction of MMPs with endogenous tissue inhibitors of MMPs (TIMPs). Under physiological conditions, there is a balance between MMPs and TIMPs. However, in pathological processes, occurs an imbalance in this equilibrium, such as in hypertension, leading to the degradation of extracellular matrix proteins and, consequently, to pathological vascular remodeling. Thus, this study had as objective to compare concentrations of MMP-9 in normotensive (NT), pre-hypertensive (PH), and controlled hypertensive (HT) individuals.

Design and method: We studied 40 healthy NT, 68 PH, and 70 HT. Normotension was defined when systolic blood pressure (SBP) < 120 mmHg and/or diastolic blood pressure (DBP) < 80mmHg without antihypertensive treatment. Prehypertensive individuals were characterized when SBP was 120 to 139 mmHg and/or DBP 80 to 89 mmHg. Controlled hypertension was defined when SBP < 140 mmHg and/or DBP < 90mmHg in antihypertensive treatment. MMP-9 concentrations are given in ng/mL. Comparison between groups was performed by Kruskal-Wallis and Dunn tests. Value-p was considered p significant < 0.05.

Results: The study included 40 NT [mean age 44.4 years (11 men (27.5%)], 68 PH [51.1 years (43 males (63.2%)], and 70 HT [mean age 59.5 years (38 men (52.4%)]. There was difference of MMP-9 among the groups (p=0.04). The statistical difference occurred between PH and HT (125.6 x 95.4 ng/ml; p=0.03), but no difference between NT and PH (120.5 x 125.6 ng/ml; p=0.68), and between NT and HT (120.5 x 95.4 ng/ml; p=0.9).

Conclusions: HT has a lower concentration of MMP-9 than PH group. Increased activity of MMP-9 in PH can impair vascular relaxation and hence contribute to arterial remodeling, indicating structural changes in this group, while antihypertensive treatment seems revert this remodeling in treated hypertensive individuals.



PP.34.35 URINARY ALBUMIN EXCRETION PREDICTS THE PRESENCE AND DEVELOPMENT OF SIMPLE RENAL CYSTS IN ESSENTIAL HYPERTENSIVE PATIENTS

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Objective: Studies on association between simple renal cysts and essential hypertension are controversial and mechanisms of this association are not clear. The aim of this study was to investigate clinical and biochemical differences between subjects with or without simple renal cysts in a large group of hypertensive patients.

Design and method: In 783 patients with essential hypertension (55% treated with antihypertensive agents) we evaluated clinical characteristics, renal function, 24 hours urinary albumin excretion, and plasma levels of aldosterone and active renin. Presence of simple renal cysts was assessed by renal ultrasound or CT scan. In 80 patients the same evaluation was repeated after a mean follow-up period of 7±2 years.

Results: Cysts have been documented in kidney of 203 patients (26%), and their presence was directly and independently associated with age (P<0.001), male gender (P=0.008), 24 hours urinary albumin excretion (P=0.014), and use of angiotensin receptor blockers (P=0.035). There was no association between presence of renal cysts and blood pressure, glomerular filtration rate, and plasma levels of aldosterone and active renin. The onset of new simple renal cysts along the follow-up period was independently and directly associated with plasma creatinine at baseline and 24 hours urinary albumin excretion at the end of follow-up.

Conclusions: In patients with essential hypertension presence of simple renal cysts is independently associated with 24 hours urinary albumin excretion but not with blood pressure severity, renal function or parameters of the renin-angiotensin-aldosterone system.

PP.34.36 CHANGING OF THE LEFT CARDIAC MORPHOLOGY IN HYPERTENSIVE PATIENTS WITH ATRIAL FIBRILLATION OVER 70 YEARS

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Objective: FA determines structural alterations of heart, such as increased ventricular mass, atrial enlargement with atrial remodeling that causes electrical dissociation between muscle structures and alterations of physiological conduction intraatriale L 'increase in atrial size is a well-known potent risk factor independent for cardiovascular disease events: it is associated with cardiac mortality, stroke, heart failure, and to all types of mortality and is associated commonly with arterial hypertension.
We want to study, the correlation of the geometric patterns of hypertension, atrial fibrillation, atrial size in male and female patientes over 70 y with coexistence of both diseases in the absence of other cardiovascular diseases, diabetes mellitus, arrived at the clinic or the emergency room of our hospital for chronic atrial fibrillation and underwent at color Doppler echocardiography.

Design and method: We have done a reviewed of 400 patients (pts) reports adimitted in cardiology outpatient and emergency room of our hospital from our echocardiographic database we extracted data on: the left ventricular mass index (LVMI), the relative thickness of the left ventricle (RWT) and size atrium in parasternal long-axis 2-D (LAs).

Results: 45% of patients: 65% males, 35% females had severe concentric hypertrophy with increased atrial size, and the average age was 76 years.
35% of patients: 60% male, 40% female presented a moderate concentric remodeling atrial size increases, the average age was 73 years.
15% of patients, with 40% males and 60% females had a normal geometry with slightly elevated atrial size, mean age 71 years.
5% of patients: 35% males, 65% females had an eccentric hypertrophy and atrial size normal with mean age 70 years old.

Conclusions: As described in the literature, we showed in our cohort of patients that the most significant atrial enlargement is associated with concentric hypertrophy and remodeling to follow concentric, with an important relationship between the mass of the left ventricle and atrial size.
This fact becomes important, because the two factors together, deterterminano a substantially increased risk of cardiac events, stroke, and heart failure in elderly subjects and to follow ospedalizazzioni long and expensive treatment.

PP.34.37 PARAMETERS OF VASCULAR STIFFNESS IN PATIENTS WITH HYPERTENSION IN CHILDHOOD AND ADOLESCENCE

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Objective: To explore the parameters of vascular stiffness in hypertensive patients from childhood and adolescence.

Design and method: Group I - patients with AH from childhood and adolescence - 27 patients (25 men, 2 women), mean age 24.2±2.0 years. Group II - 26 healthy volunteers (21 men, 5 women), mean age 25.8±3.7 years. The average duration of hypertension 9.3±3.8 years. The average age at onset of AH - 14.3±2.1 years. In 14 patients with AH was detected metabolic syndrome (MS). Arterial stiffness (pulse wave velocity, PWV) assessed by applanation tonometry (SphygmoCor). Parameters of local carotid stiffness (β-stiffness index, Ep- elastic modulus, AC- arterial compliance) were examined with echo-tracking technology by «ALOKA Prosound α 7» in distal part of both CCA in 2 cm from bifurcation.

Results: Blood pressure (BP): in group I was 146.9±9.8/86.2±10.6 mm Hg in group II - 117.6±11.8/72.9±8.5 mmHg (p<0.05). PWV in group I and II were significantly different: 7.1±1.2 m/s and 6.3±1.0m/s (p<0.05). Carotid stiffness parameters were not significantly different in the group I and II: βR-5.4±1.4 and 5±1.2, EpR-79.8±26.6 and 68.7±18.4, ACR-1.1±0.4 and 1.1±0.1; βL-5.1±1.3 and 5.3±0.9, EpL-75.7±23.8 and 71.4±16 , ACL -1.1±0.4 and 11±0.1 (ns). In hypertensive patients with MS were significantly higher performance of PWV and carotid stiffness (β and Ep) compared with patients from this group without MS : βR-6.0 ± 1.3 and 4.7±1.1, EpR-93.3±26.1 and 61.1±18.7; βL-5.6±1.2 and 4.5±1.0, EpL-86.8±23.4 and 63.6±18.3, PWV-7.5±1.4 and 6.7±1.0 (p<0.05).

Conclusions: In patients with AH from childhood and adolescents compared with the control group differed significantly only PWV. At the same time in hypertensive patients with MS were significantly higher performance of PWV and carotid stiffness.

PP.34.38 CARDIO-RENAL ECTOPIC FAT AND ORGAN DAMAGE IN HEALTHY SUBJECTS

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Objective: Visceral obesity is related to cardiometabolic risk and organ damage. Conversely, the role of low-grade inflammation, metabolic state and ectopic fat storage is not completely clear. This study evaluates the association between metabolic state, low-grade inflammation, ectopic cardio-renal fat depositions and damage in normal weight, overweight and obese healthy subjects.

Design and method: 51 healthy subjects (41±14 years, 25M/26F) divided into 3 groups according to BMI (normal weight, overweight and obeses with BMI 18.5-24.9, 25-29.9 and >=30 kg/m2, respectively), were evaluated with anamnestic data, physical examination, blood and urine samples. Low-grade inflammation was defined for serum levels of hs-CRP>2 mg/L. Ultrasonography cardiac and renal parameters, such as Left Ventricular Mass Index (LVMI), E/E' ratio, epicardial fat deposition, Renal Resistive Index (RRI) and Para-Peri Renal Ultrasound Fat Thickness (PUFT), were performed.

Results: Obeses had higher hs-CRP levels than normal weight subjects. Fasting glucose and HOMA index were significantly higher in obeses than normal and overweight subjects. Obeses had higher LVMI, E/E' and epicardial fat than normal weight subjects. LVMI was linearly related to fasting glucose (R=0.48, P<0.001), mean arterial blood pressure (R=0.50, P<0.001), whereas E/E' was related to mean arterial blood pressure (R=0.46, P=0.001) and HOMA index (R=0.37, P=0.007). Moreover, E/E' was related to LVMI (R=0.33, P=0.017) and epicardial fat (R=0.40, P=0.002). However, only the relation with epicardial fat persisted after adjustment for BMI, LVMI, metabolic and inflammatory states. PUFT was different among the 3 groups. No correlation was found between PUFT, RRI and ACR.

Conclusions: The prevalence of low-grade inflammation, altered glucidic profile and preipertension state increases from normal weight to obesity. Ultrasound determination of epicardial fat could have a role in detecting early reduced left ventricular diastolic function, when LVMI is still normal, probably due to myocardial fat deposition. Conversely, PUFT seems not to be associated to renal damage.

PP.34.39 VASCULAR STIFFNESS ASSESSMENT IN POPULATIONAL STUDY: COMPARISON OF DIFFERENT TECHNIQUES

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Objective: Vascular stiffness, especially pulse wave velocity (PWV) is considered to be a reliable marker of target organ damage and cardiovascular risk. However, availability of gold standard techniques are doubtful, measurements are complicated and observer-related. Novel techniques can be used easily and widely, but its clinical validation is still controversial. The aim of our study was to assess the correlation of different methods and their usability in epidemiological projects.

Design and method: 453 apparently healthy participants (195 males and 258 females) aged 25-64 years were randomly selected from Saint-Petersburg inhabitants. All the subjects signed informed consent and were underwent an arterial stiffness assessment by different methods: carotid-femoral pulse wave velocity by the SphygmoCor (Atcor, Australia) (PWV-S) and by VaSera VS-1500 (Fukuda, Japan) (PWV-V). VaSera VS-1500 was also used to measure cardio-ankle vascular index (CAVI).

Results: In the table significant correlations of PWV-S, PWV-V and CAVI (p<0,05) are presented.

	PWV-S	CAVI	PWV-V
Age	0,40	0,68	0,30
Weight	0,24	-	-
Height	-	0,15	-
Waist circumference	0,31	0,13	0,10
PWV-S	-	**0,42**	**0,12**
CAVI	**0,42**	-	**0,26**
PWV-V	**0,12**	**0,26**	
SBP	0,47	0,33	-
DBP	0,45	0,31	-
HR	0,18	-	-

Conclusions: All stiffness markers were age-dependent and correlated with BP level. Weak correlations between BP dependent and BP independent method of arterial stiffness estimation was found. Thus, it appears that simple substitution of the techniques cannot be used to simplify vascular stiffness assessment in clinical and epidemiology studies.

PP.34.40 COMPARISON OF HYPERTENSIVE PATIENTS WITH AND WITHOUT CHRONIC KIDNEY DISEASE IN A GENERAL INPATIENT UNIT IN SÃO PAULO, BRAZIL

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Objective: To compare hypertensive patients with and without chronic kidney disease (CKD) according to biosocial data, comorbidities and hypertension treatment.

Design and method: Cross-sectional, retrospective study conducted at the medical inpatient unit of a university hospital in São Paulo. We randomly selected the medical records of 229 patients admitted in 2009 with personal history or medical diagnosis of hypertension. CKD was defined as the presence of medical diagnosis or personal history. Significance level was p<0.05.

Results: Study sample was 51.5% female, 65.1% white, 55.8% living with partner, 40.9% active workers and aged 65.1 ± 14.4 years-old. Hypertensive patients with CKD differed (p<0.05) from those without CKD with regard to the following variables: having a partner (64.3 % vs 50.7 %); no smokers (9.9% vs. 25.0%); being diabetic (53.5% vs. 36.4 %); and having congestive heart failure (19.8 % vs 7.0%). Concerning hypertension treatment prior to hospitalization, hypertensive patients with CKD stood out (p<0.05) by the lower frequency of failure in health monitoring (6.8% vs 22.3%), using a greater number of antihypertensives (46.5% vs 31.5 % for 2 and 3 drugs and 17.4 % vs 7.0% for 4 or more drugs) and treating with the following classes: beta-blockers (34.9 % vs 19.6 %), calcium channel blockers (29.1 % vs 11.2%), loop diuretics (30.2 % vs 10.5%) and direct vasodilators (9.3% vs 2.1%). On the first day of hospitalization, 42.0% and 45.9% of hypertensive patients with and without CKD, respectively, had their blood pressure controlled, if considering the cut of 130/80 mmHg for the first group and 140/90 mmHg for the second.

Conclusions: Hypertension in CKD was associated with other risk factors for development and progression of renal injury. Given the fact that more than a half of hypertensive patients admitted to a general inpatient unit in São Paulo - Brazil were not controlled, more stringent measures in the primary care should be adopted.

POSTERS' SESSION

POSTERS' SESSION PS35
CEREBROVASCULAR DISEASES AND COGNITIVE DYSFUNCTION

PP.35.01 HYPERTENSION, MENOPAUSE, AND COGNITIVE IMPAIRMENT

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Objective: To evaluated associations between menopause, Hypertension (HTN) and cognitive impairment (CI) in a sample of women from a city in Argentina.

Design and method: Women participated in the Program "Corazon Sano" a Cardiovascular Prevention Program set up by the health Council of Villa Maria, Argentina. A closed-answer questionnaire was used in which we asked sex, age, and menopausal status. All the participants' blood pressure (BP) was measured according to standardized procedures and national and international guidelines. The Minimal Cognitive Examination (MCE) was used and it was composed of 4 tests: Mini Mental Statement Examination (MMSE), Orientation (Benton test); (c) Executive function (Clock Drawing Test) and Semantic Memory (Boston Naming Test).
Statistics: epidemiological, cross-sectional analytical study .The X^2 test was used to prove association between categorical variables. The t student test was used to verify significant statistical differences in continuous variables according to different groups. Multiple lineal regressions were calculated for the purpose of studying if the differences that we found in the t test support themselves when controlling with variables like age and schooling level.

Results: In this study 1034 women >=18 years old (47.13 ± 15.71; range 18-87 years old) were included and 48.8% of such sample were menopausal women. In this study 47.1% had HTN of which 84.1% were treated (medication/lifestyle), and only, 43.5% of the treated women were controlled.
Menopause did not change the cognitive results, but when it was related to HTN differences were found in all cognitive domains we studied: (MMSE: menopausal women 26.7(3.38) vs non-menopausal women 27.7(2.86); p .001; CDT: menopausal women 5.23 (2.0) vs. non- menopausal women 5.6 (1.6); p .014; BNT: menopausal women 7.4 (3.1) vs. non- menopausal women 8.54 (2.4); p .000) (Fig 1). The difference in cortical function (Boston test) persisted even when they were excluded from the analysis the group of women with less than primary education. There was no commitment to the orientation.

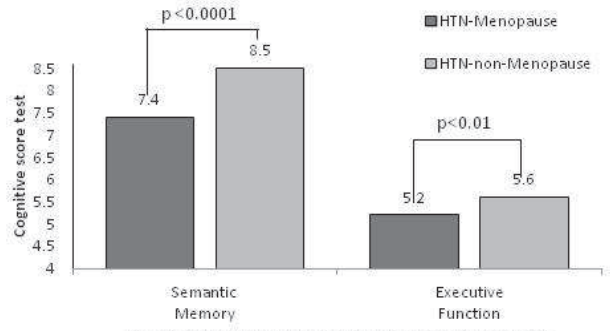

Figura 1. Hypertension, menopause and cognitive domains

Conclusions: The presence of hypertension in MNP women could be responsible for neuropsychiatric profiles altered both for commitment to subcortical (executive dysfunction) as for the cortical (semantic memory disturbances).

PP.35.02 COGNITIVE DEFICIENCY IN HYPERTENSIVE PATIENTS IS ASSOCIATED WITH CAROTID INTIMA-MEDIA THICKNESS AND ELEVATED CENTRAL SYSTOLIC BLOOD PRESSURE

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Objective: The role of hypertension in the loss of cognitive function is controversial. Relationships between hypertension and increases in cerebral vascular resistance, diffused lesions and multiple lacunar infarcts of the white matter are well known. Thus, the objectives of this study were: to evaluate the relationship between hypertension and cognitive deficiency (CD), identify risk factors and determine the association between early markers of vascular disease and CD in hypertensive individuals.

Design and method: Two hundred individuals aged between 40 and 80 years old were evaluated in this cross-sectional study. Fifty participants were normotensive (NT). The remaining 150 hypertensive patients were subdivided into two groups, those with CD (HCD) and those without CD (HNCD). All participants underwent clinical evaluations and biochemical blood tests were performed. CD was investigated using the Mini Mental State Examination (MMSE) following the guidelines for its use in Brazil. The impact of hypertension on the arterial bed was assessed by identifying and measuring changes in the intima-media thickness (IMT) by vascular ultrasonography of the carotid arteries and analyses of the central blood pressure and Augmentation Index by applanation tonometry of the radial artery.

Results: There were no significant differences in the total cholesterol, high-density lipoprotein cholesterol and triglycerides plasma concentrations between the three groups. The serum creatinine and estimated glomerular filtration rate were within normal ranges for all three groups. A significantly lower MMSE score was recorded for the HCD Group compared to the HNCD and NT Groups (p-value < 0.05).
The IMT was significantly different between the HNCD and HCD Groups (p-value = 0.0124). A significant difference in the IMT was also observed between hypertensive patients and the NT Group (p-value < 0.0001).
The central systolic pressure was significantly higher in the HCD and HNCD Groups compared to NT Group (p-value < 0.0001). There were no significant differences in the Augmentation Index (corrected for heart rate) between the three groups.

Conclusions: Hypertensive patients with CD have changes in the vascular morphology characterized by an increased carotid IMT and hemodynamic functional impairment manifested by elevated central systolic blood pressure.

PP.35.03 EVALUATION OF EFFECTIVENESS OF ANTIHYPERTENSIVE THERAPY IN HYPERTENSIVE PATIENTS WITH VERTEBROBASILAR INSUFFICIENCY

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Objective: To evaluate the effectiveness of two regimens of treatment of hypertensive patients (HP) with vertebrobasilar insufficiency (VBI) using method of single-photone emission computed tomography (SPECT).

Design and method: The studty included 133 HP with VBI:47 men, 87 women, age 58,1±11,2 years. Patients were divided into two groups matched for age, sex, severety of VBI. 65 HP of the 1 group were appointed ACE inhibitor Perindopril 5-10 mg daily and 24 mg of Betahistine per day. 68 HP of the 2 group received calcium antagonist Lercanidipine 10-20 mg per day and if necessary we added Perindopril 5-10 mg per day to achieve target blood pressure (BP) levels. Cerebral hemodynamics was studied at baseline and 4 weeks after treatment. Tomogarams were visually evaluated on availability zones or foci of low radioactivity due to the reduction of cerebral perfusion; also we determined volume of cerebral flow in cerebral hemisheres.

Results: Baseline cerebral perfusion shows a decline in the level of perfusion

in HP compared with normal of the same age: in the right hemishere - 34,0±2,7 ml/100gr/min, in the left hemishere - 32,9±3,1 ml/100gr/min. 37% of HP showed a reduction in the perfusion of focal character; 49% - the asymmetry of the blood supply in the basis of internal carotid artery (ICA), 37% of HP had visual signs of perfusion changes with unilateral reduction of radioactivity in the vertebrobasilar basin brain. According SPECT in HP of the 2 group after treatment was significantly improved perfusion of the brain (on the right hemishere 43,1±3,8 ml/100 gr/min and on the left hemishere 42,2±3,3 ml/100 gr/min), in 1 group was not significantly changed (37,0±2,7 ml/100 gr/min and 35,9±3,1 ml/100gr/min respectively). Clinical improvement of VBI after treatment was observed in 32% of HP in the 1 group and in 67% of HP in the 2 group.

Conclusions: Treatment of HP with VBI using Lercanidipine and Perindopril improves perfusion by reducing spasm of cerebral arteries and improves clinical status of HP.

PP.35.04 INFLUENCE OF CAROTID ENDARTERECTOMY ON BLOOD PRESSURE IN HYPERTENSIVE PATIENTS

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Objective: To assess the impact of carotid endarterectomy (CE) on arterial hypertension (AH) in hypertensive patients with critical stenosis of the internal carotid artery (CSICA).

Design and method: The study included 80 hypertensive patients with CSICA, mean age 62±7,3 years. In all patients secondary forms of AH were excluded. All patients underwent 24-hours blood pressure monitoring (24-h BPM) and ultrasound scanning of carotid arteries (USCA) before and after surgical treatment. Initially 100% of patients had AH: 14 patients (18%) had I grade of AH, 46 (57%) -II grade, 20 (25%) - III grade at the combined antihypertensive treatment (ACE-inhibitors, calcium antagonists and/or diuretics). All patients underwent eversion carotid endarterectomy.

Results: Postoperative 24-h BPM and USCA were performed on a 3-6 day. Based on test results after surgical treatment of CSICA positive trend in levels of blood pressure (BP) was observed in 59 patients (74%), 6 of them had no AH after surgery without any antihypertensive drugs. BP has not changed in 17 patients (21%), has increased in 4 patients (5%).
Table 1 shows the distribution of stages (grades) of AH before and after surgical treatment.
Based on this data we were able to optimize antihypertensive therapy: to reduce doses and amount of drugs in 35 patients (44%) thereby improving treatment compliance in this patients.

Table 1 Degree of AH before and after CE

	No AH	I stage AH	II stage AH	III stage AH
Before CE, pts (%)	0	14 (18%)	46 (57%)	20 (25%)
After CA, pts (%)	6 (8%)	27 (34%)	34 (43%)	13 (16%)
P	0,04	0,02	0,05	0,17

Conclusions: The majority of hypertensive patients with CSICA after the surgical correction is marked positive effect on BP : BP reduction or normalization. This indicated a close relationship between brain perfusion and BP in hypertensive patients with CSICA.

PP.35.05 ELEVATED OFFICE-, HOME- OR AMBULATORY PULSE PRESSURE AND MILD COGNITIVE IMPAIRMENT IN HYPERTENSIVE PATIENTS

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Objective: Pulse pressure (PP) may be an independent risk factor for target organ damage. An early clinical presentation of brain damage is mild cognitive impairment (MCI). Our previous results show correlation between elevated self-measured PP and MCI. We studied if there is correlation between all other types of blood pressure measurement and MCI in a larger group of hypertensive patients (Pts).

Design and method: We included 931 hypertensive Pts in the initial visit [347(37.27%) males, 584(62.73%) females] and 263(28.25%) [178 females (30.48% of the initially recruited), 85 males (24.49% of the initial number)] during the follow-up visit after at least 6 months (6-20, mean 12). The mean age was 65.90±10.00 years. All of the Pts were on combination hypertensive treatment. Neuropsychological testing was done with Montreal Cognitive Assessment (MoCA) and Mini Mental State Examination (MMSE). Geriatric Depression Scale, Hachinski Ischemic Index and 4-IADL were also used. Blood pressure was recorded in the office, at home, 450 of the Pts had ambulatory monitored blood pressure during the inclusion and 213 during the follow-up. Pts underwent also basic laboratory and echocardiography evaluation.

Results: The Pts with elevated home measured PP>55 mmHg on inclusion had lower MoCA and MMSE results during the inclusion ($p<0.0001$) visit independently of the other blood pressure variables. Those with elevated PP>55 mmHg during the follow-up had lower results also during the follow-up evaluation ($p=0.013$ for MoCA, $p=0.027$ for MMSE). The group of Pts with elevated office PP>55 mmHg had significantly ($p=0.02$) lower neuropsychological tests' results than those with controlled PP. The Pts with MCI had significantly ($p<0.05$) higher 24-hour, day and night PP values on ambulatory monitoring of the blood pressure, respectively on inclusion and during the follow-up visit.

Conclusions: Elevated PP in suboptimally controlled hypertensive Pts is an important independent factor for persisting target organ damage of the brain – clinically manifested with MCI. It should be evaluated routinely and treated properly in order to reduce the likelihood of MCI incidence.

PP.35.06 THE CORRELATION BETWEEN RESULTS OF THE MINI-MENTAL STATE EXAMINATION AND MONTREAL COGNITIVE ASSESSMENT TEST WITH PULSE WAVE VELOCITY IN PATIENTS WITH PRIMARY HYPERTENSION

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Objective: Relationship between scores of The Montreal Cognitive Assessment (MOCA) and Mini–mental state examination (MMSE) with pulse wave velocity (PWV) in patients with primary hypertension. The usefulness of these tests both in assessing the cognitive disorders.

Design and method: The study involved 65 patients (26 men and 39 women) aged 51 to 83 years with primary hypertension treated for an average 9,5 years. The ambulatory blood pressure monitoring (ABPM) was performed in all patients. Arterial stiffness was evaluated by carotid-femoral pulse wave velocity measurement using Complior method in supine position at room temperature. The global cognitive assessment of patients was based on the neuropsychological tests: MMSE and MoCA performed by the physician. The abnormal result of PWV is higher than 10 m/s. The score indicates mild cognitive impairment is < 26 in MMSE test and <= 26 in MoCA test. The Spearman test was taken to analyze the correlation, the t-student test was used for the statistical analysis.

Results: In our study the mean systolic blood pressure was 126,66 ± 11,6 mmHg and the mean diastolic blood pressure was 77,83 ± 8,97 mmHg. We showed 52 patients with PWV >10 m/s and 47 patients indicated mild cognitive impairment (4 of them was with normal score of PWV). The mean value of :PWV was 12,12 ± 2,33 m/s, MMSE was 25,88 ± 2,13 points and MoCA was 24,18 ± 2,28 points. PWV significantly correlated with score of MMSE ($r = -0,500963$, $p < 0,05$) and MoCa ($r = -0,390957$, $p< 0,05$). Moreover, PWV was higher in subjects with MCI (12,75 ± 2,22 m/s) than in those without cognitive impairment (10,24 ± 1,5 m/s), $p = 0,05$.

Conclusions: Results showed the relationship between PWV and scores of MMSE and MOCA tests, which indicate MCI; first of these tests seems to be better in the assessment of cognitive function. Arterial stiffness contributes to mild cognitive impairment in hypertensive patients, suggesting that functional changes of the arterial system could be involved in the onset of dementia in a population of subjects with hypertension.

PP.35.07 HYPERTENSION MANAGEMENT IN THE ACUTE PHASE OF ISCHEMIC STROKE IN FIVE EUROPEAN COUNTRIES. THE ESH STROKE SURVEY

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Objective: There is no sufficient evidence to guide management of blood pressure during the acute phase of ischemic stroke. Current guidelines suggest not to decrease blood pressure until severely elevated. However, it is not clear how to manage patients with previous antihypertensive medication. The aim of this study was to compare management of antihypertensive drug treatment during the acute phase of ischemic stroke among five European countries enrolling at least 150 patients in the hospital arm.

Design and method: Management of antihypertensive drug treatment was compared among 1506 patients coming from Hungary (n=279), UK (n=159), Spain (n=156), Greece (n=175), and the Czech Republic (n=737) participating in the ESH Stroke Survey. A retrospective analysis of consecutive patients hospitalized for their first-ever ischemic stroke was performed.

Results: In total, 179 (64%) patients from Hungary, 77 (48%) from UK, 104 (68%) from Spain, 133 (76%) from Greece, and 560 (76%) from the Czech Republic had known preexisting hypertension. During the first 24 hours since admission, 233 (84%) from Hungary, none from UK, 25 (16%) from Spain, 20 (12%) from Greece, and 420 (57%) from the Czech Republic received any antihypertensive therapy (p for difference between countries <0.001). The dose of antihypertensive treatment was increased compared with the period prior to stroke in 146 (63% of those receiving antihypertensive therapy) from Hungary, 14 (56%) from Spain, 8 (40%) from Greece, and 126 (30%) from the Czech Republic, while the dose was decreased in 3 (1% of those receiving antihypertensive therapy) from Hungary, 7 (28%) from Spain, 3 (15%) from Greece, and 40 (10%) from the Czech Republic (p for difference between countries <0.001).

Conclusions: There is a significant difference in blood pressure management during the acute phase of stroke among five selected countries in Europe. Adequately powered randomized clinical trials are needed to guide continuation/discontinuation of antihypertensive therapy in the acute phase of stroke.

PP.35.08 EFFECT OF ANTIHYPERTENSIVE TREATMENT ON CEREBRAL BLOOD FLOW IN A MOUSE MODEL FOR ALZHEIMER'S DISEASE

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Objective: Hypertension is a risk factor for Alzheimer's disease (AD). It is a treatable condition which opens important avenues for prevention of AD. Elevated angiotensin II (AngII) is an important cause of essential hypertension and has deleterious effects on endothelial function and cerebral blood flow (CBF). In this study we therefore investigated the interaction between AngII, blood pressure (BP), and CBF in the APPswe/PS1[Delta]E9 (APP/PS1) mouse model of AD.
Moreover, agents that block the effects of AngII may reduce the risk of AD in hypertensive patients. We therefore also investigated the effects of antihypertensive treatment with AngII blockers. To differentiate between effects of AngII and elevated BP per se, we tested an intervention with two BP lowering agents: 1) the diuretic hydrochlorothiazide (HCT) and 2) the AngII-blocker eprosartan mesylate (EM).

Design and method: We studied the effect of 2 months of induced hypertension (AngII-infusion using osmotic micropumps, vs saline (sal) as control) and, subsequently (after 1 month of induced hypertension) the effect of treatment (vs placebo) with antihypertensives (EM, 0.35mg/Kg or HCT, 7.5mg/Kg, vs water) on BP and CBF in 10 months-old wildtype C57bl6/j (WT) and APP/PS1 mice. BP was monitored twice a month via tail cuff plethysmography. CBF was measured with MR Flow-sensitive alternating Inversion Recovery.

Results: In this study, we showed that chronic AngII-infusion increased BP in both transgenic and WT mice, while AngII-infusion decreased the hippocampal and thalamic perfusion only in APP/PS1 mice. Furthermore, in both hypertensive and control condition, APP/PS1 mice had a higher BP than their WT littermates. In addition, compared to non-transgenic animals both antihypertensives were less effective in transgenic animals in returning the AngII-induced hypertension to normal levels.

Conclusions: Together, these data suggest an interaction between APP/PS1 induced pathologies, BP, and antihypertensive treatment. Our results also reveal an association between hypertension (AngII), APP/PS1 and CBF.
Additional data will be presented on the impact of AngII-induced hypertension and subsequent treatment with EM on cognition, structural and functional connectivity.

PP.35.09 ANALYSIS OF MRI-DTI DIFFUSION VALUES AS AN ALTERNATIVE TO THE FAZEKAS SCORE IN OLDER HYPERTENSIVE PATIENTS WITH SUBJECTIVE MEMORY COMPLAINTS

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Objective: The goal of the present work was to study the relationship between cognitive performance and the under or overrepresentation of mean diffusivity (MD), and fractional anisotropy (FA) value classes in elderly subjects with high blood pressure and subjective memory complaints.

Design and method: Clinical composite scores for memory, verbal fluency and visual memory capacity were collected in 89 subjects aged 60 to 85 years who had undergone an MRI examination. MD and FA value classes were determined based on literature data. The percentage of voxels falling within each class was then calculated in an automated process.

Results: Multivariate analyses demonstrated a significant association between the memory score and FA class 2 ($r = -0.22 \pm 0.10$; $p = 0.034$) and MD class 1 ($r = 0.04 \pm 0.02$; $p = 0.013$). FA class 2 was also significantly associated with the verbal fluency score ($r = -0.22. \pm 0.09$; $p = 0.016$). The MD class 3.2 was significantly associated with the visual memory capacity score ($r = -0.19 \pm 0.07$; $p = 0.014$). The regression models demonstrated no significant associations between the Fazekas score and the cognitive scores.

Conclusions: Our study demonstrated that an increase in the amount of deteriorated white matter is associated with poor cognitive scores. The calculation of diffusion values in terms of class can be entirely automated and appears to be more sensitive than the Fazekas score for identifying subjects with a high risk of cognitive decline. The interest of this approach for long-term patient follow-up needs to be confirmed in a longitudinal study.

PP.35.10 PREVALENCE OF HYPERTENSION AND OTHER SELECTED CARDIOVASCULAR RISK FACTORS IN PATIENTS WITH ALZHEIMER'S DISEASE COMPARED TO SUBJECS WITHOUT COGNITIVE IMPAIRMENT

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Objective: To evaluate the presence of hypertension (HT), other cardiovascular risk factors (including gender, history of smoking, lipid profile abnormalities, presence of diabetes mellitus, DM) and established coronary artery disease (CAD) in a large sample of patients with Alzheimer's Disease (AD) in comparison to matched subjects without cognitive impairment (Mini Mental Scale (MMSE) score>=27 points) representing general population.

Design and method: We evaluated group of 420 patients with AD (155M, 265F, mean age:77,5±1,7,range:75-80) and age and education matched group of 186 subjects without cognitive impairment (126M, 60F, mean age:78,2±3,4,range:75-88). Patients with AD were referred and diagnosed in the Department of Neurology, Warsaw through years 2000-2006. Subjects without cognitive impairment were selected from WOBASZ Senior Study–multicenter study of population health status conducted in Poland in 2007. The cognitive function was assessed based on the MMSE score. In all subjects cardiovascular risk profile was assessed.

Results: There was no difference in age between patients with AD and subjects without cognitive impairment (77,5vs78,2ys, p=0,93), whereas the groups differed in terms of gender distribution (frequency of male 36,9%vs67,7%, p<0,01,

respectively). Therefore we compared separately men and women with AD and without cognitive impairment.
In men with AD, HT, CAD and history of smoking were less frequent (44,2%vs60,3%, p<0,05 and 42,9%vs57,1%, p<0,05 and 46,1%vs62,7%, p<0,01, respectively), office BP values were lower (132/76vs150/83mmHg, p<0,001) and HDL serum level (1,42vs1,28mmol/l, p<0,01) was higher as compared to men without cognitive impairment. There were no differences in total and LDL cholesterol serum levels, nor in frequency of DM between the groups. In women with AD, HT and CAD were less frequent (45,8%vs78,3%, p<0,001 and 39%vs68,3%, p<0,001 respectively), office BP values were lower (137/78 vs 156/87mmHg, p<0,001) and HDL serum level (1,65vs1,42mmol/l, p<0,001) was higher as compared to women without cognitive impairment. There was no difference in total and LDL cholesterol serum levels, nor in frequency of history of smoking and DM between the groups.

Conclusions: Both elderly men and women with AD are characterized by lower frequency of HT and CAD as compared with age and education matched subjects without cognitive impairment.

PP.35.11 LACK OF REGRESSION OF LEFT VENTRICULAR HYPERTROPHY IS ACCOMPANIED BY ADVERSE PROGNOSIS IN ESSENTIAL HYPERTENSIVES

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Objective: We sought to investigate the prognostic role of left ventricular hypertrophy (LVH) regression regarding incidence of cardiovascular disease in essential hypertension.

Design and method: We prospectively followed up for a median period of 3.8 years 1226 essential hypertensives (mean age 57.8 years, baseline office BP=143.6/89.3mmHg). All subjects visited periodically the outpatient hypertensive unit of our institution and office BP at follow up was calculated based on the measurements of the last 3 visits. Echocardiographic evaluation and determination of the metabolic profile and creatinine levels was performed at entry and at follow up. LVH was defined as LV mass index >or=116g/m² in men and LV mass index >or=96g/m² in women. Endpoint of interest was the incidence of stroke, coronary artery disease and their composite.

Results: At the end of follow up the incidence of the composite end-point was 4.0% (17 patients with stroke, 34 with CAD, 2 with both). According to the presence of LVH at baseline (20.2%) and at the end of follow-up (15.9%) patients were divided in two groups: with normal LV mass index at both examinations or with LVH at baseline and regression of hypertrophy (n=1031, 84.1%, group 1) and with LVH at baseline and at follow-up and with normal LV mass index at baseline and LVH at follow-up (n = 195, group 2). Hypertensives of group 2 compared to those of group 1 were older (by 6.3 years, p<0.001), more frequently females (by 19%, p<0.001) and had at baseline greater duration of hypertension (by 2.6 years, p<0.001), increased number of antihypertensive drugs (by 0.6, p<0.001) office pulse pressure levels (by 5mmHg, p<0.001), increased body mass index (by 0.8kg/m², p=0.024), glucose (by 7.4 mg/dl, p<0.001) and decreased creatinine clearance (by 10.5 ml/min/, p<0.001). Survival analysis revealed that hypertensives without LVH regression (group 2) compared to those of group 1 exhibited significantly higher rates of stroke (5.1% vs. 0.7%, log rank p<0.001) and the composite end-point (7.7% vs. 3.3%, log rank p=0.020).

Conclusions: Lack of regression of LVH is accompanied by adverse prognosis in essential hypertensives.

PP.35.12 EARLY EXERCISE TRAINING IMPROVES BRAIN MICROCIRCULATION ALTERATIONS INDUCED BY CEREBRAL HYPOPERFUSION IN RATS

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Objective: Chronic cerebral hypoperfusion is an important risk factor for brain neurodegenerative dysfunctions. The experimental model of permanent bilateral carotid arteries occlusion (two vessels occlusion, 2VO) aims to study the effects of chronic hypoperfusion on ischemic injury. Here we investigate the impact of early exercise on the cerebral microcirculation of 2VO rats.

Design and method: Thirty male Wistar rats, aged 12 weeks old were randomly divided into three groups: 2VO non-exercised group (2VO SED, n=10), 2VO exercised group (2VO EX, n=10) and non-exercised sham-operated group (SHAM SED, n=10). Physical exercise consisted of 7 days for 30 minutes at 60% of maximum speed. Systolic blood pressure (SBP) was evaluated by photo-plethysmography. The cerebral (pial membrane) microcirculation of anesthetized rats was assessed using intravital fluorescence videomicroscopy through a cranial window. The functional capillary density considered as the number of spontaneously perfused capillaries per mm², was determined in random microscopy fields during 4 minutes. To observe leukocyte/endothelium interactions, leukocytes were labeled by i.v. administration of rhodamine 6G (0.5 mg/kg).

Results: The 2VO-SED group presented an increase in SBP when compared to SHAM-SED group (149±3 mmHg vs 130±3 mmHg, respectively; p<0.05). Intravital microscopy analysis showed that this effect was accompanied by brain functional capillary rarefaction (2VO-SED: 146±26 capilares/mm² vs SHAM-SED: 310±30 capilares/mm²; p< 0.05) and increased leukocyte adhesion in the venular walls (SHAM-SED: 1.1±0.4 vs 2VO-SED: 3.4±0.9 cells/min; p<0.05). The early training after 2VO in the 2VO-EX group reversed the brain capillary rarefaction (303±5 capilares/mm², p<0.05) and the endothelial-leukocyte interaction (1.0±0.4 cel/min, p<0.05) when compared to 2VO-SED group.

Conclusions: The model of cerebral chronic hypoperfusion induces brain functional capillary rarefaction and venular inflammation in rats that can be prevented by early exercise training.

PP.35.13 LOWER ANKLE-BRACHIAL INDEX IS ASSOCIATED WITH FUTURE DECLINE OF COGNITIVE FUNCTION IN A COMMUNITY-DWELLING POPULATION AGED 80 YEARS AND OVER

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Objective: Vascular risk factors have been concerned with the development of cognitive decline and dementia. The aim of this study is to determine the association of the ankle brachial index (ABI) and brachial-ankle pulse wave velocity (baPWV) and cognitive impairment in a community-dwelling population aged 80 years and over.

Design and method: We conducted health check in 197 subjects aged 80 years and over in 2007. We measured ABI and ba-PWV by an automatic oscillometric method. The Mini-Mental State Examination (MMSE) was also used to measure global cognitive status. Fifty nine participants were followed and measured on baseline and 4 years later. The participants were divided into two groups, cognitive preserved group and declined group. We defined 5 points and over decreased in MMSE as cognitive decline. The lower ABI and higher baPWV on baseline as predictive values of cognitive decline were determined by using a multiple logistic regression analysis after adjusting for confounding factors.

Results: Eight participants were declined cognitive function. ABI at baseline was lower in cognitive declined group than those in cognitive preserved group (0.96±0.03 vs. 0.98±0.02, P<0.05). According to the multiple logistic regression analysis, the lower ABI at baseline was found to be a significant independent risk factor of the cognitive decline, whereas the higher brachial-ankle PWV was not.

Conclusions: A lower ABI was an independent risk factor for cognitive decline in community-dwelling older populations aged 80 years and over.

PP.35.14 HIGH PULSE PRESSURE IS ASSOCIATED TO IMPAIRED VERBAL FLUENCY

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Objective: To establish whether pulse pressure modifies verbal fluency at population level.

Design and method: Five-hundred and one unselected participants (mean age 61.2±18.4 years, 56% women) representative of Italian general population were studied in the frame of the Growing Old with Less Disease Enhancing Neurofunctions (GOLDEN) study. Verbal fluency was detected requiring participants to generate names from a specified category in a fixed period of time in 3 trials of 60 seconds each. Systolic and diastolic blood pressure (SBP and DBP) were measured in triplicate through an Omron 75IT device, and the last measurement was taken into consideration in the analysis of data to minimize the white coat effect, if any. Pulse pressure (PP) was calculated as SBP-DBP. Anthropometrics, lifestyle

habits, heart rate and plasma serum levels of lipids, uric acid and glucose were collected. Multivariable linear regression was used to examine the effect on verbal fluency test of PP while accounting for age, BMI, blood exams and lifestyle covariates. This analysis was repeated to test the effect on verbal fluency of SBP and DBP, log transformed to avoid correlation between the two independent variables.

Results: After adjustment for the above mentioned confounders, PP resulted to be significantly and inversely associated to verbal fluency (coeff. -2.9, odds ratio 0.12). When the components of PP were used instead of PP, SBP was inversely associated (coeff. -6.8, odds ratio 0.001 and DBP directly associated (coeff.4.2, odds ratio 6.7) to verbal fluency while accounting for confounders.

Conclusions: Our findings demonstrate that verbal fluency is negatively affected by high SBP, particularly when associated to low DBP, i. e. by high PP. Maintaining low PP is therefore useful not only in order to prevent cardiovascular events, but also to maintain a good verbal fluency. This is of particular interest for teachers and for those who work with words, such as sellers, politicians and so on. Apart from this, verbal fluency is an index of cognitive function, so that the here presented results confirm that keeping low PP should be a goal of antihypertensive therapy.

PP.35.15 INFLUENCE OF ANXIOUS-DEPRESSIVE DISORDERS ON THE STRUCTURAL CHANGES OF THE BRAIN AND PARAMETERS OF BLOOD PRESSURE PROFILE IN HYPERTENSIVE PATIENTS

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Objective: The combination of a cardiovascular pathology and anxious-depressive disorders meets very often. However, not enough data on their influence on development of latent structural changes of a brain and blood pressure profile. Objective of our study was to investigate the relation of anxiety and depression to parameters of 24-h blood pressure profile, structural damages of brain and heart rate variability parameters (HRV) in hypertensive patients.

Design and method: Sixty eight essential hypertensive patients aged between 25-60 years (mean 47.4±5.6 years, mean duration of hypertension – 12,7 ± 4.3 years) were included in the study. Beck´s Depression scale, Sheehan questionnaire, brain MRI, 24-h ABPM and HRV were performed in all patients. Of parameters HRV were defined mode (M) of NN intervals, TINN and triangular index (TI). Their decrease reflect increase sympathetic activity.

Results: Structural changes of brain were detected in 84,5% hypertensive patients. Degree of anxiety positively correlated with degree of structural changes of brain. Increase of severity of structural changes of brain was related to increase of degree of anxiety. The highest level of anxiety was observed in patients with severe structural changes of brain (5-7 grade of hypertensive encephalopathy) and was significantly more than in patients with degrees 1 (p=0,01) or 2 (p=0,032) of hypertensive encephalopathy. Degree of depression positively correlated with variability of day systolic (R=0,72, p=0,003) and diastolic (R=0,86, p=0,001) BP. Degree of anxiety positively correlated with daytime systolic (R=0,61, p=0,001) diastolic (R=0,57, p=0,007) BP, daytime diastolic BP load (R=0,58, p=0,03), nighttime systolic (R=0,56, p=0,03) and diastolic (R=0,61, p=0,001) BP load and inversely with diastolic BP dip (R= - 0,64, p=0,0013). Degree of anxiety inversely correlated with TI (r=-0,38, p=0,016) and TINN (r= -0,27, p=0,025). Thus, increase in anxiety and depression was associated with increase sympathetic activity. . Probably, that it is one of the possible mechanisms of development.

Conclusions: Our study demonstrates that anxiety is associated with development of structural damages of brain. Anxiety and depression has negative effects on 24-h profile of BP in hypertensive patients. Possibly, it is mediated by increase in sympathetic activity.

PP.35.16 ARTERIAL REACTIVITY OF BRAIN IN PATIENTS WITH RESISTANT HYPERTENSION AFTER RENAL SYMPATHETIC DENERVATION

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Objective: The aim of this study was evaluate state autoregulation Arterial Reactivity of brain (ARB) in patients with resistant hypertension after renal sympathetic denervation (RSD).

Design and method: All participants of research have given the informed agreement. We used ultasonography of transcranial Doppler`s method in the middle cerebral arteries (MCA) from temporal window. We studied the changes of flow Velocity mean (Vm) starting, during hypercapnia(HC) (inhalation 2min 4% mixture of carbonic gas with air) or hyperoxia (HO) (inhalation 100% oxygen) and FmV in period of recovery (rec) (air-inhalation 2min) of 46 patients with essentially hypertensive (BP > 160/100 mm Hg despite three or more antihypertensive drugs), age 52,9±8.9years, initially (i) and 24weeks after (a) RSD. We used Indexes of FVm - IFVm=(Vm0-Vm)/ Vm0*100, Index of Recovery IR=Vm0/Vmrec, Speed Modification FVm – SM FVm=(Vm-Vm0)/120, coefficient - Normalized to Blood Pressure Answer NBPA=(Vm-Vm0)/(Vm0*(BP–BP0)). Vm0, BP0 are starting and Vm, BP are the parameters at period of inhalation, Vmrec is Vm after 120sec. - time of inhalation. RSD was done bilaterally using transfemoral access (8 ablation points, temperature control mode, target t=600C, power limit=8 watt, duration=2 min). The patients were instructed to maintain pharmacotherapy unchanged during the study. Statistical analysis: descriptive, t-test independent by groups, t-test dependent samples.

Results: Patients had: initial three of tipes of ARB HO - normal 9.1%, abnormal reduced 23.6%, abnormal opposite 67.3%, after RSD - 53.6%, 33.3%, 10.4% respectively and two tipes of ARB HC: normal 30.8%, abnormal reduced 69.2%, after RSD - 35.4%, 64.6% respectively. Parameters of ARB HO were i/a RSD: IFVm 5.4±1.3/11.7±2.8 p=0.00, SM FVm 0.98±0.28/-4.32±1.2 p=0.00, NBPA -0.45±0.12/0.41±0.09 p=0.03. Parameters of ARB HC were i/a RSD: IFVm 24.7±8.2/31.5±12.8, p=0.49 IR 1.51±0.05/1.01±0.02, NBPA -3.3±0.1/8.4±2.1.

Conclusions: Arterial Reactivity of brain was initial in patients with resistant hypertension: normal, abnormal reduced, abnormal opposite types of reaction and these reaction changed and intensity and speed of the autoregulation ARB improved after renal sympathetic denervation.

PP.35.17 EFFECT OF IMMUNOREXTM ON HYPERTENSIVE AND DIABETIC RATS

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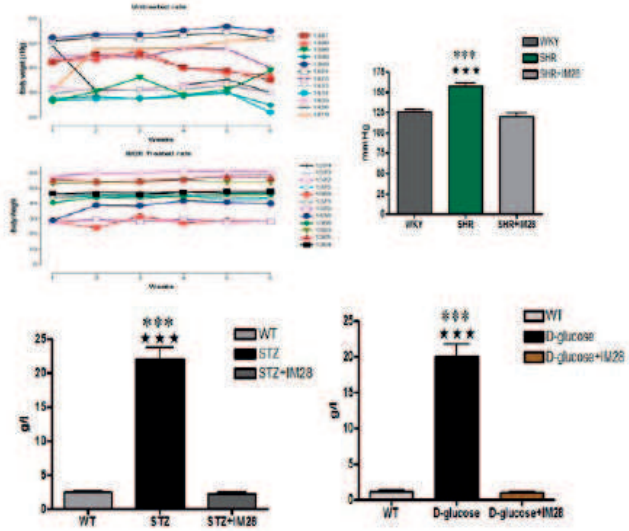
Objective: Recently we demonstrated the capacity of IMMUNOREXTM (IM28) to block NADPH oxidase activation from diabetic rats aortas. (Mavoungou, ISHIB, 2013).
NADPH oxidase is a major source of reactive oxygen species (ROS); it can be up regulated by both acute and chronic conditions in response to various stimulis such as growth factors, cytokines, high glucose levels and hyperlipidemia; in that way IMMUNOREXTM normalized glucose and lipids levels and blood pressure in infected HIV-1 patients under HAART (Maka et al, JAA, 2009). In the present work we want to verify IMMUNOREXTM effects on bodyweight, glucose in types I and II diabetic rats as well as blood pressure in spontaneous hypertensive rats to correlate its effect on NADPH oxidase activation with the normalization of biological parameters related to diabetes and hypertension for its recommendation in cardiovascular diseases treatment.

Design and method: Effect of Immunorex on NADPH oxidase, bodyweight, blood pressure (Tail flick test), glycemia, blood gazes, were measured in spontaneous hypertensive rats (SHR) and in types I and II diabetic rats (WT and STZ); with statistical analysis performed as described in.(ISHIB 2013, ISH 2010).

Results: IMMUNOREXTM normalized significantly at p<0.01,bodyweight and glucose levels in (type I and type II) diabetic rats and blood pressure in spontaneous hypertensive rats. No effects was observed in the blood gazes which remained normal after ImmunorexTM administration (Figure 1).

Figure 1:Immunorex effect on hypertensive and diabetic rats.



Conclusions: ImmunorexTM by targeting ROS, via NADPH oxidase, glucose 6-phosphate deshydrogenase (G6PD) for normal Nitric oxide (NO) levels contributed to normalization of glucose, lipids levels, blood pressure and bodyweight of treated spontaneous hypertensive rats and types I and II diabetic rats in agreement with datas in HIV-1 infected patients under HAART with metabolic disorders. (Maka et al, JAA), to be taken in consideration for treatment of both HIV infection and cardiovascular diseases.

PP.35.18 LONG-TERM EFFECTS OF OLMESARTAN, AN ANGIOTENSIN II RECEPTOR ANTAGONIST, ON CEREBRAL PERFUSION AND COGNITIVE FUNCTION IN POST-STROKE PATIENTS WITH HYPERTENSION

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Objective: Hypertension is a major risk factor in the development of stroke, and there is a relationship between hypertension and vascular dementia, the latter of which results in marked neurocognitive dysfunction and social disadaptation of patients. The aim of the present study is to estimate cerebral perfusion and cognitive function in post-stroke patients with hypertension before and after hypotensive therapy with Angiotensin II receptor blockers (ARBs).

Design and method: The treatment group comprised 28 post-stroke patients (57.8 ± 8.3 years) with previously untreated or ineffectively treated essential hypertension. All patients underwent brain xenon-enhanced computed tomography (Xe-CT) scanning and comprehensive neuropsychological testing, both before and after 24 weeks of hypotensive therapy using the ARB, olmesartan medoxomil. The control group comprised 20 age-matched post-stroke patients (56.6 ± 8.5 years) without hypertension, carotid atherosclerosis, coronary artery disease, or psychiatric disorders.

Results: The hypertensive patients had significantly lower levels of cerebral perfusion (4–8%) in all brain regions, a 25% decrease in attention and psychomotor speed, and an 18% decrease in mentation compared with the control subjects. Following 6 months of hypotensive therapy, the hypertensive patients experienced an increase in cerebral perfusion by 8–15% in all brain regions, an 18–36% improvement in attention and psychomotor speed, and an average 19% improvement in abstract mentation.

Conclusions: Hypertensive patients showed marked signs of cerebral hypoperfusion and impaired cognitive function, as indicated by decreased attention, reduced psychomotor speed, and slow mentation; however, these symptoms were improved by 24 weeks of hypotensive treatment with an ARB. It remains unclear how decreases in BP can decrease the risk of dementia; however, it is conceivable that antihypertensive treatment reduces the frequency of small (silent) insults. It is also possible that hypotensive therapy improves cognitive function through its positive effect on cerebral perfusion. Indeed, the present study established a direct correlation between the improvement in mentation and the increase in regional cerebral blood flow in numerous brain regions, with the closest correlation being observed in the frontal and temporal lobes.

PP.35.19 INTERDEPENDENCE OF ADMISSION TIME TO THE HOSPITAL AND MORTALITY IN PATIENTS WITH STROKE

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Objective: Acute stroke is one of the leading causes of morbidity and mortality worldwide. The aim of the study was assessment of influence of the admission time to the hospital on the mortality in patients with stroke.

Design and method: All the cases that were admitted to the neurological department of Grodno Regional Clinical Hospital of Medical Rehabilitation with acute stroke in 2013 year were included in the study. In all patients CT-scan of the brain was done during the first 24 hours as well as complete physical and laboratory examination.

Results: A total of 1103 patients with acute stroke (519M/584F, 30-100 years old) were included in the study. 1018 patients has acute ischemic stroke (IS) and 85 patients has hemorrhagic stroke (HS). Within 3 hours from the beginning of the stroke 183 patients admitted to the hospital (19 HS and 164 IS). Among them 6 patients with HS (31.6%) and 40 patients with IS (24.4%) died. 336 patients (28 HS and 308 IS) admitted to the hospital within 3-6 hours from the beginning of the stroke. Among them 3 patients with HS (10.7%) and 34 patients with IS (11.0%) died. 212 patients (12 HS and 200 IS) admitted to the hospital within 7-24 hours from the beginning of the stroke. Among them 4 patients with HS (33.3%) and 36 patients with IS (18%) died. 372 patients (26 HS and 346 IS) admitted to the hospital more than 24 hours from the beginning of the stroke. Among them 6 patients with HS (23.1%) and 46 patients with IS (13.3%) died. Middle age of died patients was 77 years old.

Conclusions: Clear dependence of mortality from stroke and time of admission to the hospital is not revealed. The high mortality in the first hours after stroke is due to the large volume of brain lesions and older age of patients. There is a high frequency of late seek for medical help by patients with stroke. Early diagnostics and early treatment can improve outcomes of patients with stroke

PP.35.20 COMPARISON OF COMORBIDITY OF HYPERTENSION AND MILD COGNITIVE IMPAIRMENT IN ATRIAL FIBRILATION'S PATIENTS AFTER STROKE AND MIOCARDIAL INFARCTION

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Objective: Mild Cognitive Impairment is the frequent sequela of patients with neurovascular and cardiovascular disorders, especially patients with Atrial Fibrilation and may lead to vascular dementia.
Aim: Establish the role Hypertension on development of MCI after stroke and Miocardial Infarction.

Design and method: 192(93/99) poststroke and post- MI patients with AF were investigated and underwent MRI scan. Cognition and daily activity evaluated by MMSE, ADL Index, Cognitive function investigated by neuropsychological battery test and acute phase and after 3 months. Depression were evaluated by Hamilton Depression Rating Scale.
According to the test data both neurological (after Stroke) and cardiovascular (after Miocardial Infarction) patients with atrial fibrilation were separately divided in III groups:
I- MCI alone, II- Hypertension alone, III- MCI+Hypertension.
Groups did not differ due to vascular risk-factors and demographic variables.

Results: From patients with MI - MCI and Hypertension alone was diagnosed in 56 (56,5%) and 38(38,3%), but after Stroke in 42(45,1%) and 76 (81,7%) cases respectively. Hypertension+MCI- were revealed after MI in 42(42,2%) and postStroke in 68 (71,1%) cases, - Comparision of both groups revealed that Hypertension +MCI and Hypertension alone have more frequently were in poststroke group as well as ADL Index and MMSE, but Depression alone 58(58,5%) and Executive Dysfunction Syndrome alone 63 (63,6%) more frequently as well their comorbidity(34/34,3%) in cardiac patients vs posstroke. (p< o.o5).which were correlated with multiple lacunar silent damage radiologically.

Conclusions: In AF-poststroke patients more demented and hypertensive (OR 9.90, P = 0.031)., but the AF-MI patients have more frequently have mild cognitive decline and depression(OR 8,9, P >0.001).

PP.35.21 ACUTE HYPERTENSIVE RESPONSE IN ISCHEMIC STROKE IS ASSOCIATED WITH INCREASED AORTIC STIFFNESS

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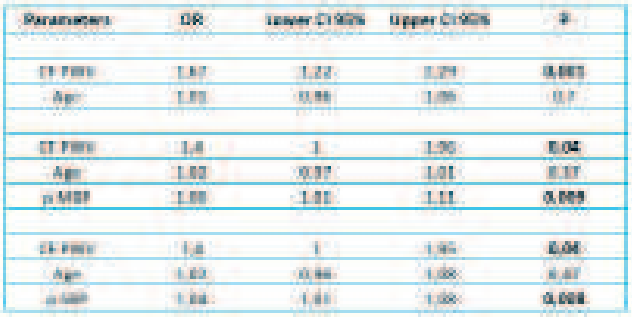
Objective: Acute hypertensive response (AHR) is a common consequence of stroke. It's estimated that up to 75% of patients suffer from elevated blood pressure in the acute phase of stroke. AHR is associated with poor short-term and long-term outcomes. Although AHR is very common, factors affecting its development are still poorly understood. The aim of the study was to evaluate whether aortic stiffness is associated with acute hypertensive response in ischemic stroke patients.

Design and method: 102 (69 male (67%), mean age 62±12, NIHSS 6,8±5,1) patients with acute ischemic stroke were enrolled into the study. The inclusion criteria were: 1) known time of symptoms onset 2) hospitalization within the first 24 hours from stroke onset. Exclusion criteria were: 1) pre-stroke disability 2) contraindications to perform aplanation tonometry . Aplanation tonometry (SphygmoCor®, Atcor, Sydney, Australia) was performed on day 7 after stroke.

Results: AHR occurred in 73 patients (71%). Mean systolic blood pressure (SBP) and mean blood pressure (MBP) were higher in the AHR group (148,5±23,4 vs. 126,1±14,1 p<0,001 and 105,9 (±15,9) vs. 91,1 (±9,8) p<0,001

respectively). Univariate analysis showed significantly higher values of carotid-femoral pulse wave velocity (CF-PWV) in patients with AHR (10,9±2,5 vs. 8,3±2,01, p<0,001). After adjustment for age and peripheral blood pressure the difference remained statistically significant (Table).



Conclusions: Acute hypertensive response in ischemic stroke patients is independently associated with aortic stiffness.

PP.35.22 BLOOD PRESSURE VARIABILITY AS OUTCOME PREDICTOR IN HYPER-ACUTE PHASE OF ISCHEMIC AND HEMORRHAGIC STROKE

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Objective: Blood pressure variability in acute stroke is not yet elucidated completely. Data on BP changes during the hyper-acute phase of ictus are lacking. The purpose of our study was to investigate the prognostic role of BP variability (BPV) on ischemic and hemorrhagic stroke patients.

Design and method: The study population consisted of 300 first ever hyper-acute stroke patients. Subjects were divided according to etiology in ischemic (IS) and hemorrhagic (HS) stroke patients. All subjects underwent 24- BP- Monitoring (BPM) during the first 24hours after stroke onset in order to assess BPV. Standard deviations (SD) for systolic BP (SBP) and diastolic BP (DBP) during 24 hours, day-time and night-time were used as indices for BPV. Primary end point was 1-year total mortality rate.

Results: The study population consisted of 239 IS and 61 HS patients. HS patients presented significantly higher day-time SBP variability compared to IS patients (p=0.017). Multivariate Cox regression analysis revealed day-time SBP variability and age as significant outcome predictors for IS patients but not for HS patients. The hazards ratio for 1-year mortality associated with each point increase in day-time SBP SD during the hyper-acute phase of ischemic stroke was 1.1 (95% CI: 1.021-1.175, p=0.011).

Conclusions: Day time SBP variability during hyper-acute phase of ictus seems to be a significant predictor of outcome for IS but not for HS patients. However, HS patients present higher values of day-time SBP variability compared to IS patients. These findings suggest that SBP variability during the acute phase of stroke plays an important but different role in IS and HS patients possibly because of different underlying pathophysiological mechanisms.

PP.35.23 EARLY MORNING BLOOD PRESSURE, PULSE WAVE VELOCITY, CENTRAL AORTIC PRESSURE AND PREDICTIVE RISK FACTORS OF ISCHEMIC STROKE IN MASKED HYPERTENTION PATIENTS

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Objective: The clinical significance of early morning hypertension(EMHT) is not still somewhat clear. We evaluated the prevalence of masked early morning or nocturnal hypertension (NHT) and effects of arterial stiffness, pulse wave velocity(PWV) and wave reflections on central aortic pressure (CAP) in hypertensive patients with ischemic stroke(IS).

Design and method: We analyzed a total 450 hypertensive patients with IS, investigate masked hypertension(MHT) using 24hr ambulatory blood pressure monitoring (ABPM). Among the MHT, classified as masked EMHT (early morning BP >= 135/85 mmHg and night-time BP <= 120/70 mmHg), Masked NHT(Daytime BP <= 135/85 mmHg and night-time BP >=120/70 mmHg). And using radial artery applanation tonometry, aortic pulse analysis was performed in MHT.

Results: 128 patients was observed MHT with ischemic stroke. EMHT was found in 55.6% of MHT patients (n=71). Compared with patients with both EMHT and NHT, EMHT had higher aortic pulse wave velocity(PWV) and augmentation index(AI) and AI75 (AI to HR 75 beat/min), ASP (Central aortic systolic pressure) and pulse pressure were also higher in the EMHT.

Conclusions: Our results suggest that higher prevalence of masked EMHT. A significant increase of early morning BP, especial systolic BP, might be predictive risk factor of ischemic stroke events rather than nocturnal BP. Hence ASP measurements might be particularly important for the early detection of ischemic stroke event.

PP.35.24 A HIGH-NORMAL ANKLE-BRACHIAL INDEX (ABI) IS ASSOCIATED WITH CEREBRAL MICROBLEEDS IN SCREENED COHORT OF JAPANESE: THE OPAD STUDY

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Objective: A low and extra-high ABI indicate peripheral arterial disease and high risk for cardiovascular disease and stroke. However, we have recently reported that the ABI was lowest at <40 years, increased with age until 60-69 years, and decreased thereafter in the subjects with screened cohort. We hypothesized that ABI increased with age as a result of arterial stiffness, and decreased when atherosclerotic stenosis occurred in the lower limbs. Because arterial stiffness is associated with the pathogenesis of cerebral small vessel disease, such as cerebral microbleeds (CMBs), we investigated the relationship between ABI and CMBs.

Design and method: A retrospective cross-sectional study included 990 (median 53 [24-86] years old, 531 female) consecutive cardiovascular disease-free and stroke-free subjects, who underwent brain MRI and ABI in health checkup program from 2003 to 2010. The exclusion criterion was the ABI <=0.9 and >=1.4. We divided subjects into 2 groups, with CMBs (4%) or without CMBs (96%). We compared characteristics, vascular risk factors, and ABI between these two groups. Independent factors associated with CMBs were determined by multiple logistic regression analysis, adjusted for age, sex, vascular risk factors, systolic and diastolic blood pressure, carotid plaque score (PS), white matter hyperintensities (WMHs), silent brain infarction (SBI), brachial ankle pulse wave velocity (baPWV) and ABI.

Results: The ABI tended to positively correlated with baPWV (r = 0.07). Compared with subjects without CMBs, subjects with CMBs had significantly higher ABI, baPWV, prevalence of hypertension, antihypertensive agent use, PS, WMHs and SBI. A cutoff level which predicts CMBs was 1.12 for ABI and 16.07 m/s for baPWV. In multivariate logistic regression analysis, WMHs (Odds ratio[OR] 3.06, 95% confidence interval [CI] 1.45-6.95, P=0.003) and ABI >=1.12 (OR 2.67; 95%CI 1.34-5.63, P=0.005) were found to be independently associated with CMBs. Among subjects <55 years, the ABI was significantly higher in the subjects with CMBs than in those without CMBs, but not in subjects >=55 years.

Conclusions: The ABI was significantly higher in subjects with CMBs than those of without CMBs. A high-normal ABI is associated with CMBs in this study.

PP.35.25 REFLECT OF LEFT VENTRICULAR MASS INDEX (LVMI) TO THE WHITE MATTER HYPERINTENSIVITY (WMH) AND COGNITIVE PERFORMANCE IN HYPERTENSIVE STROKE PATIENTS

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Objective: Cardiovascular risk factors in cognitive decline were extensively studied during the past years. Blood pressure (BP) is a predictor of concurrent and subsequently measured white-matter hyperintensity (WMH), but interaction between LVM,WMH and cognition not have been established yet.
To identify, how the LVM index (LVMI) is correlated with WMH and cognitive decline in hypertensive stroke patients.

Design and method: The hypertensive 134 stroke patients (mean age 68±5,2 male/female ratio 76/ 58) were divided into 3 groups: I group(54)- mild LVMI, II group(42)-moderate LVMI, III-severe LVMI(38). In acute stage after stroke and 3 months later the depression symptoms and cognitive profile were evaluated by

Hamilton Depression and Anxiety Rating Scale, neuropsychological battery tests (executive function, visuospatial, verbal and visual memory, reasoning, recall, digit span and ect.) Neuroradiological assessment of WMH have been done.

Results: There was not any relationship between LVMI and WMH and cognitive decline. In II group LVMI strongly correlated with mild WMH with mild cognitive impairment as well as HAM-D. In a III group LVMI strongly correlated with moderate-to-severe WMH (p<0.0005). and cognitive decline, especially impairment memory, mostly short-term memory. (p<0.005), as well as moderate-to-severe HAM-D and HAM-A(p<0.005).

Conclusions: This small study revealed, that level of LVMI due to severity of hypertension, may reflect the cognitive impairment, because of cardiocerebral and haemodynamic damage. These patients may prevent and improve quality of life, cognitive and psychological symptoms by the strict control of the hypertension as well as by receiving the antidepressants and inhibitors of the enzyme acetylcholinesterase.

PP.35.26 PREVALENCE OF COGNITIVE IMPAIRMENT AND ITS ASSOCIATED FACTORS AMONG THE ELDERLY WITH HYPERTENSION IN TWO RURAL DISTRICTS

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Objective: The prevalence of hypertension is rising. Cognitive impairment is associated with wide range of negative consequences, including significant worsening of co-morbid medical conditions, high mortality risk, and socioeconomic burden resulting from functional impairment. Therefore, it is relevant to establish the diagnoses of cognitive impairment in the elderly patients with hypertension. This study aims to identify the prevalence of cognitive impairment among the elderly with hypertension at two rural districts in Malaysia and also to identify associated factors related to it.

Design and method: This cross-sectional study was conducted from 18 November till 29 November 2013 in six randomly selected health clinics in Hilir Perak, Perak and Sabak Bernam, Selangor to determine the prevalence of cognitive impairment among elderly hypertensive patients. A total of 209 patients aged 60 years old and above attending health clinics at that period of time participated in the study. Elderly Cognitive Assessment Questionnaire (ECAQ) questionnaire was used to measure the cognitive impairment level of those elderly hypertensive patients. Data analysis was done using x2 test, simple and multiple logistic regressions.

Results: Study revealed that 12.4% of these respondents had cognitive impairment. It was also found that cognitive impairment was significantly associated with the educational level p<0.001 of a person. Age [p<0.001(-7.297, -2.781)] of a particular patient also showed significant association with the cognitive impairment.

Conclusions: Based on the result, the prevalence of cognitive impairment among elderly hypertensive patients in Hilir Perak and Sabak Bernam districts was relatively low. However, immediate recognition and action need to be taken both at clinical and public health levels so that these issues can be prevented and treated.

PP.35.27 BLOOD PRESSURE LOWERING AND CLINICAL OUTCOMES IN PATIENTS WITH ACUTE ISCHEMIC STROKE: CHINA ANTIHYPERTENSIVE TRIAL IN ACUTE ISCHEMIC STROKE (CATIS)

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Objective: Observational studies have reported that a decrease in blood pressure (BP) within the first several days after stroke onset was associated with poorer, better, or no difference in adverse clinical outcomes among patients with acute ischemic stroke. We investigated the association of immediate BP lowering in acute ischemic stroke patients with major clinical outcomes at 14 days or hospital discharge and at a 3 month follow-up visit.

Design and method: CATIS is a randomized clinical trial conducted in 4,071 Chinese patients with ischemic stroke within 48 hours of onset and elevated systolic BP (SBP). Patients were randomly assigned to receive antihypertensive treatment or control. The primary outcome was a combination of death and major disability (a modified Rankin score >=3) at 14 days or hospital discharge or at the 3 month follow-up visit. Multiple logistic regression analysis was used to adjust for baseline age, gender, SBP, NIHSS score, time of stroke onset, history of antihypertensive treatment, and intervention assignment.

Results: Compared to patients with a >0-10% reduction in systolic BP within the first 24 hours after admission, the multivariable-adjusted odds ratios (95% confidence interval [CI]) for patients with <=0%, 11-20%, and >=21% reduction in SBP were 1.40 (1.08, 1.82), 1.00 (0.81, 1.23), and 0.98 (0.73, 1.30) at 14 days or hospital discharge; and 1.31 (1.00, 1.71), 0.82 (0.66, 1.02), and 0.78 (0.58, 1.05) at 3 months follow-up. Compared to patients with a BP 130-139/85-89 mmHg at 7 days after admission, the multivariable-adjusted odds ratios (95% CI) for patents with BP <130/85, 140-159/90-99, and >=160/100 mmHg were 1.07 (0.82, 1.38), 1.09 (0.89, 1.34), and 1.58 (1.18, 2.11) at 14 days or hospital discharge, and 0.89 (0.67, 1.17), 1.10 (0.89, 1.36), and 1.50 (1.11, 2.03) at 3 months follow-up, respectively.

Conclusions: These data indicate that a lack of BP reduction in the first 24 hours of hospitalization and higher BP levels at 7 days after admission predict increased risk of death and major disability at 14 days or hospital discharge and at 3 months follow-up.

PP.35.28 DEMOGRAPHIC FACTORS AND CO-MORBIDITIES ASSOCIATED WITH PREVALENT STROKE AMONG HYPERTENSIVE IN COMMUNITIES IN KARACHI, PAKISTAN

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Objective: Cerebrovascular diseases have become the leading cause of death and disability in both high and low-middle income countries (LMICs). In South Asia itself, age standardized mortality death rates from NCDs including cardiovascular diseases and strokes have surpassed those from communicable and other conditions. We aimed to determine the sociodemographic factors and co-morbidities associated with prevalent stroke among hypertensive in communities in Karachi, Pakistan. We also sought to determine existing practices regarding use of therapy to prevent secondary stroke in this population.

Table 1: Comparison of baseline characteristics of hypertensive patients aged 40 years and older by self-reported physician-diagnosed stroke with no stroke in low-to-middle income settings of Karachi (n=2817).

Characteristics	*Physician Diagnosed* Stroke n=120 (4.3%)	No Stroke n=2697 (95.7%)	*p* value
Mean age (±SD) yrs	57.9 ±11.7	53.2 ±13.1	<0.001
Male n (%)	53 (44.2)	975 (36.2)	0.074
[1]Low education level n (%)	84 (70.0)	1521 (56.4)	0.003
[2]Tobacco use n (%)	31 (25.8)	595 (22.1)	0.331
[3]Diabetes n (%)	33 (27.5)	536 (19.9)	0.042
[4]MET Score <840 n (%)	109 (90.8)	2173 (80.6)	0.005
[5]Obesity n (%)	65 (54.2)	1623 (60.2)	0.189
[6]Central Obesity n (%)	92 (76.7)	2144 (79.5)	0.454
Mean Systolic BP mm Hg	159.7 ±25.9	149.3 ±23.9	<0.001
Mean Diastolic BP mm Hg	94.3 ±14.4	90.6 ±13.1	0.002
Medicine Use			
[7]Any antihypertensive n (%)	57 (47.5)	927 (34.4)	0.003
[8]Statins or Platelet Inhibitor n (%)	29 (24.2)	314 (11.6)	<0.001

[1]Low education: less than 5th grade of formal education or no formal education: High education: more than 5th grade of formal education.
[2]Those who smoked at least 100 cigarettes in their lifetime and are currently smokers and or chewed tobacco products at least 20 times in their lifetime and are currently using these products.
[3]Diabetes defined as use of hypoglycemic medications, or having fasting blood sugar ≥126 mg/dL.
[4]METs (Metabolic Equivalent Score) estimated from International Physical Activity Questionnaire (IPAQ): Total METs-minutes/week. Walk. (METs*min*day) + Moderate and Vigorous activity score (METs*min*day); Sedentary: <840 METs and Active (moderate to vigorous): ≥840 METs.
[5]Obesity: Asian specific criterion of BMI ≥25.
[6]Central obesity: Waist circumference of ≥ 80 cm in women and ≥ 90 cm in men.
[7]Hypertension: Physician diagnosed hypertension or taking anti-hypertensive medications or blood pressure reading ≥140 mm Hg systolic or ≥90 mm Hg diastolic on two different occasions.
[8]Single or combination of 2 or more than 2 antihypertensive drugs (ACEIs or ARB, Beta Blockers, Calcium Channel Blockers or Thiazide-like Diuretics and other agents).
[9]Statins or Aspirin or Clopidogrel single or in combination.

Table 2. Crude and adjusted ORs (95% CIs) for self-reported physician diagnosed stroke in hypertensive patients in low-to-middle income settings (n=2817)

Covariates	Crude ORs (95% CIs)	*p* value	Adjusted* ORs (95% CIs)	*p* value
Age (years)	1.03 (1.02-1.05)	<0.001	1.03 (1.01-1.04)	0.002
Gender (Male)	1.40 (0.90-2.28)	0.139	1.70 (1.06-2.71)	0.027
Low education	1.80 (1.70-2.78)	0.008	1.77 (1.10-2.86)	0.019
[1]Tobacco use	1.23 (0.86-1.75)	0.250	-	-
Sedentary lifestyle	2.39 (1.35-4.22)	0.027	2.37 (1.29-4.35)	0.005
Diabetes	1.53 (0.95-2.47)	0.083	1.74 (1.06-2.85)	0.027
Obesity	0.78 (0.63-0.98)	0.031	-	-
Central obesity	0.85 (0.57-1.25)	0.405	-	-
Systolic BP (mmHg)	1.02 (1.01-1.02)	<0.001	-	-
Diastolic BP (mmHg)	1.02 (1.01-1.03)	<0.001	1.02 (1.00-1.04)	0.055

*Adjusted for cluster

Design and method: We conducted a cross-sectional study on 2,817 participants aged >=40 years with hypertension in 22 representative communities in Karachi, Pakistan. Stroke was defined as self-reported physician diagnosed stroke. Cluster adjusted multivariable model was built and logistic regression analysis was performed to determine independent sociodemographic and clinical factors associated with prevalent stroke.

Results: A total of 120 [(4.26%, (95% CI: 3.57%-5.07%)] adults reported physi-

cian diagnosed stroke. Tobacco, BMI, and waist circumference, blood pressure and cluster adjusted demographic, lifestyle, behavioral factors and clinical factors including increasing age [1.03, (1.01-1.04)], being male [1.70, (1.06-2.71)], low education [1.77, (1.10-2.86)], sedentary lifestyle [2.37, (1.29-4.35)] and diabetes [1.74, (1.06-2.85)] were independently associated with prevalent stroke. Less than 50% and individuals with stroke were receiving any antihypertensive agents, and less than 25% were on any statins or antiplatelet therapy.

Conclusions: Our findings highlight a high prevalence of stroke with a reverse social gradient among individuals with hypertension in Karachi, Pakistan. Despite a significant burden of stroke and associated co-morbidities, the risk factors are poorly controlled and access to preventive therapy remains sub-optimal. Our findings highlight the need for urgent efforts for primary and secondary prevention of stroke in high-risk populations in Pakistan, and possibly other LMICs.

PP.35.29 ASSOCIATION BETWEEN COGNITIVE IMPAIRMENT AND CEREBRAL HEMODYNAMIC IN ESSENTIAL HYPERTENSIVE PATIENTS

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Objective: To investigate the relationship between cerebral hemodynamic parameters and cognitive function in patients with essential hypertension (EH).

Design and method: In 79 pts with EH (average age 60,8±0,9; 51 males) we measured ultrasonographically diameter (D) of common carotid (CCA), internal carotid (ICA) arteries, carotid intima-media thickness (IMT), blood flow velocities (BFV) in CCA, ICA, medium cerebral arteries (MCA). We determined the pulsatility index (PI) and resistance index (RI) at the CCA, ICA, MCA by transcranial Doppler ultrasonography parameters. Cognitive function was assessed in all pts by Mini Mental State Examination (MMSE). All patients were divided into 2 groups depending on the MMSE results: group I (n=48) with a MMSE score>=24, group II (n=31) with a MMSE score<24. Morning fasting venous blood samples were obtained from all subjects for uric acid, lipid profile, glucose assays. MMSE results were related to parameters of carotid structure, BFV, RI and PI, blood laboratory values by bivariate correlation analysis.

Results: Carotid diameter and IMT were increased in pts with cognitive decline compared with pts with normal cognitive function (accordingly: DCCA 7,89±0,13 vs 6.73±0.17 mm, p <0.001, DICA 5,33±0,08 vs 4,54±0,05 mm, p<0.001, IMT 1.14±0.03 vs 0.61±0.05 mm, p<0.001). The mean blood flow velocity in MCA was significantly low in group II pts compared with group I pts but PI and RI – significantly higher (accordingly: BFVmean 0.73±0.05 vs 0.95± 0.05 m/sec, PI-0,94±0,01 vs 0,73±0,01, RI-0,63±0,01 vs 0,51±0,01). The same changes we observed in CCA and ICA. No statistically significant differences were obtained between the two groups in terms of systolic blood pressure, diastolic blood pressure, total cholesterol, triglycerides, LDL cholesterol, serum uric acid, glucose. MMSE results were related to DCCA (-0,70, p<0.001), DICA (-0,50, p<0.02), TIM(-0,89, p<0.001), MCA RI (-0,6, p<0.05) and PI (-0,53, p<0.001). Multiple regressions analysis has shown that TIM is independent predictor of cognitive impairment in pts with EH.

Conclusions: Our data suggested that cognitive impairment in EH pts associated with severity of the carotid structure damage and increasing vascular resistance of carotid and medium cerebral arteries that is the result of arterial stiffening.

PP.35.30 BLOOD PRESSURE REACTIVITY PREDICTS 3-MONTH FUNCTIONAL OUTCOME IN PATIENTS AFTER ISCHEMIC STROKE

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Objective: The effects of blood pressure (BP) and its fluctuations on the clinical course of ischemic stroke are incompletely understood. Whether elevated BP and its reactivity in the subacute phase of the stroke are associated with functional outcome remains unclear. The aim of our study was to clarify whether BP and BP reactivity at day 7 after stroke onset predict the long-term functional outcome. We tested the hypotheses that BP Reactivity Index (BPRI) [(office BP – mean daytime BP)/mean daytime BP] is independently associated with stroke outcome.

Design and method: In a prospective study, we included 93 patients (mean age 61.5 +/- 12.7, NIH Stroke Scale score (NIHSS) 6.2+/- 5.6) with acute ischemic stroke. Ambulatory BP monitoring (SpaceLabs device) was performed on day 7 after stroke onset. The daytime period was defined as the interval from 6 AM to 10 PM; nighttime, from 10 PM to 6 AM. The relationship between these measures (adjusted for age, sex, admission neurological deficit as assessed by NIHSS score, glucose level, BP and HR) and the 90-day poor outcome (death or dependency, modified Rankin Scale > 2) was studied using a multivariate logistic regression.

Results: 22 (23.7%) patients had moderate to severe functional impairment after stroke. BPRI was significantly higher in patients with poor outcome (16.0 +/- 22.8 vs 1.2 +/-13.8; p<0.001).
In univariate analysis, high BPRI (OR=1.61; 95% CI, 1.19-2.17; p=0.002) was significantly associated with poor stroke outcome. Neurological deficit measures and glucose level on admission and systolic BP and heart rate at day 7 also predicted stroke functional outcome.
In multivariate analysis, the predictive value of BPRI remained significant (OR=2.72; 95% CI, 1.03-7.19; p=0.039) after adjustment for age, sex, baseline neurological deficit score, heart rate and systolic BP, measured at day 7, as well as use of rtPA. By contrast, BP levels had no significant predictive value after adjustment.

Conclusions: This study indicates, that BP reactivity is an independent predictor of functional outcome in patients after ischemic stroke.

PP.35.31 EFFECT OF HIRULOG-LIKE PEPTIDE ON MIDDLE CEREBRAL ARTERY OCCLUSION-INDUCED BRAIN INJURY IN MICE

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Objective: Hirulog-like-peptide (HLP) reduced vascular neointimal formation or restenosis in animals undergoing balloon catheter injury in carotid artery. However, the effect of HLP on ischemic brain injury remains unclear. Here, we examined the effect of HLP on brain injury, thrombin receptor (PAR-1), oxidative stress and apoptosis after ischemic stroke.

Design and method: Mice treated with vehicle, HLP or low molecular weight heparin calcium (LMWH) before middle cerebral artery occlusion (MCAO). Infarct volume and neurologic deficits were evaluated 1, 3 and 14 days after ischemic insult. PAR-1, catalase, caspase-3, Bax, bcl-2 and malondialdehyde (MDA) contents in the brain were determined after tMACO.

Results: We demonstrated that HLP and LMWH alleviated brain ischemic volume and improved neurologic outcomes, MDA, Bax contents and increased catalase abundance in tMACO mice compared to the controls (p<0.05). HLP but not LWMH, significantly decreased PAR-1, caspase-3 contents and increased bcl-2 protein and bacl-2/Baxratio in the ischemic brain compared to controls (p<0.05).

Conclusions: HLP and LWMH reduced ischemic volume and improved neurologic outcomes induced by tMACO. HLP demonstrated stronger beneficial effects on the regulation of thrombin receptor and key apoptosis regulators in mouse brain compared to LWMH, suggesting HLP may be potential alternative therapy for arterial occlusion-induced cerebral ischemia.

PP.35.32 ARTERIAL STIFFNESS AND CEREBROVASCULAR DISORDERS IN HYPERTENSIVE ADULTS

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Objective: Arterial stiffness (AS) is an integrative parameter reflecting a total cardiovascular risk especially in arterial hypertension (AH). We aimed to determine relationship AS with cerebral structure damages and cognitive consequences in hypertensive adults.

Design and method: 144 patients (63 male, mean age 61+/-11 years) with AH were enrolled. Previously 69 (48%) pts experienced a lacunar stroke (1 group), other stroke-free pts consisted 2 group. All patients were undergone neurocognitive testing (Dubois B. et al., 1999). Using MRI (1.5 T) focal and diffuse cerebral damages were estimated, including cerebro-ventricular index (CVI). To evaluate AS aortic pulse wave velocity (PWVa) and arterial stiffness index (ASI) were determined using 24-hour ambulatory blood pressure monitoring (BPLab® with Vasotens® technology, Russia).

Results: ASI averaged 161+/-42,2 and was compatible in both groups: 165+/-

43,8 and 158+/-40,6. PWVa ranged up 6,4 to 10,3 m/s, mean value 7,8+/-0,8 m/s. PWVa didn't differ in 1 and 2 groups: 7,8+/-1,48 vs 7,7+/-0,68 m/s respectively. Cerebral damages were presented post-stroke and silent foci, dilated perivascular spaces (DPVS), leucoaraiosis (LA), cortical atrophy and ventricular system expansion. In both group AS raising associated with increasing CVI due to central and cortical atrophy on MRI. And in 1 group ASI correlated with the grade of DPVS (p<0,001), LA (p<0,03) and multiple focus lesions (p<0,00001). Neurocognitive decline was correlated with ASI: r=-0,27 (p=0,003) and r=-0,20 (p=0,02) in 1 and 2 gr. After multiple regression analysis PWVa was revealed as independent risk factor of a cognitive decline in hypertensive adults. By means of ROC-analysis it has been found that PWVa 7,85 m/s and more can predict a cognitive impairment (AUC: 0,665, p=0,03, CI: 0,519-0,811).

Conclusions: Independently of previous stroke increased AS is a significant factor of a cognitive impairment in AH due to a different cerebral structural damage including cortical and central atrophy.

PP.35.33 HYPERTENSION AND COGNITIVE IMPAIRMENT

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Objective: Hypertension is a known risk factor for cognitive decline and studies had shown the relationship between blood pressure level and cognitive impairment. However not much data is currently available on this problem in Malaysia. The aim of this study was to estimate the magnitude and investigate the risk factors for cognitive impairment among patients with known hypertension.

Design and method: This cross-sectional study was conducted in the health district of Hilir Perak and Sabak Bernam, Malaysia. Convenience sampling technique was employed for selection of participants with known history of hypertension. Ethical approval was obtained from the Research Ethics Committee Universiti Teknologi MARA, Malaysia. Informed consent was obtained from all participants who volunteered to paticipate. Their socio-demographic information such as age, gender, education level, ethnicity, occupation and marital status were recorded. Details on the medical history, comorbidities, latest blood pressure levels, weight, height, were extracted from their medical records. The elderly cognitive assessment questionaire (ECAQ) and the hospital anxiety and depression scales (HADS) were used to assess cognitve impairment and depression respectively.

Results: Data was collected from 541 hypertensive patients. The prevalence of cognitive impairment was 10.0% (95% CI 7, 13%). Cognitive impairment was significantly associated with age, odds ratio (OR) 1.161 (95% CI 1.115, 1.208), gender (female) OR 2.187 (95% CI 1.187, 4.027), no formal education OR 7.571 95% (CI 4.178, 13.719), depression OR 1.229 (95% CI 1.136, 1.329) and duration of diabetes mellitus OR 1.056 (95% CI 1.0005, 1.1142).

Conclusions: The prevalence of cognitive impairment is high among hypertensive patients. There is a need to place emhasis on preventive startegies to identify and manage the risk factors in these patients. Impaired cognitive performance has serious implications for quality of life and healthcare costs.

PP.35.34 LOWER COGNITIVE PERFORMANCE IN ELDERLY HYPERTENSIVES IS NOT CORRELATED WITH ALTERED MYOGENIC AND SYMPATHETIC MODULATION OF SYSTOLIC BLOOD PRESSURE

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Objective: To correlate cognitive performance with supine and orthostatic beat-to-beat variability of systolic blood pressure (SBP) in elderly normotensives and hypertensives.

Design and method: Cognitive performance was assessed by CAMCOG in non-demented elderly normotensives [NTN; n=20 (7 women); 68±1yo; 131±3mmHg; education=11±1y] and hypertensives [HTN; n=42 (26 women); 68±1yo; 149±3mmHg; education=8±1y]. Depression was assessed by Beck Depression Inventory. We measured beat-to-beat supine SBP for 15 min and during a 30-min head-up tilt with Finometer. Supine and orthostatic myogenic and sympathetic modulation of SBP were assessed through spectral analysis of SBP variability in the low frequency (LF; 0.04-0.15 Hz) band.

Results: CAMCOG global score was greater in NTN (87±2 vs 77±1, p<0.001). Supine and orthostatic LF SBP power were similar in NTN and HTN (supine: 8±2 vs 8±1mmHg², p=0.9; orthostatic: 16±3 vs 11±1mmHg², p=0.1) whereas orthostatic to supine LF SBP power ratio was smaller in HTN (2.6±0.4 vs 1.7±0.2, p=0.03). In a linear multivariable model controlled for sex and depression, hypertension and less education, but not SBP variability indices, were independent adverse predictors of CAMCOG global score (Table; p-value of model<0.001).

Model	B (SE)	P-value of B
Education	1.1 (0.2)	<0.001
Hypertension	-5.0 (1.9)	0.01
Sex	1.3 (1.6)	0.4
Depression	-0.5 (0.4)	0.2
S-LF SBP power	0.2 (0.2)	0.3
O-LF SBP power	-0.1 (0.1)	0.7
O-LF/S-LF SBP power	0.3 (0.9)	0.8

B, unstandardized coefficient; S, supine; O, orthostatic

Conclusions: Normotensives exhibited better cognitive performance than hypertensives. Also, decreased orthostatic to supine LF SBP power ratio suggests altered myogenic and sympathetic modulation of SBP in hypertensives. Moreover, hypertension and less education, but not indices of beat-to-beat SBP variability, were associated with lower cognitive performance. Altogether, these results suggest that lower cognitive performance in elderly hypertensives is not correlated with altered myogenic and sympathetic modulation of systolic blood pressure.

PP.35.35 CAROTID PLAQUE(S) PREVALENCE AND DETERMINANTS OF CALCIFICATION IN MIDDLE-AGED HYPERTENSIVE PATIENTS

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Objective: Essential hypertension is an established risk factor for carotid atherosclerosis. This study sought to assess the prevalence, location and morphology of carotid plaque(s) as well as determinants of calcification in middle-aged hypertensive patients.

Design and method: A total of 756 consecutive newly diagnosed, never treated, non-diabetichypertensives without known cardiovascular disease (52±13 years, 53% males) referred to the outpatient antihypertensive unit of our institution were studiedin accordance to the European Society of Hypertension guidelines. Allparticipantsunderwent a carotid ultrasound: the far wall common carotid intima-media thickness (IMT) was measured 1 cm before carotid bulb while carotid plaque(s)prevalence, location, and echogenicity and the degree of stenosis were determined.

Results: The median and maximal IMT were 0.67 mm (0.59-0.79) and 0.82 mm (0.73-0.96), respectively. Increased IMT (>0.9mm) was found in 32.4% of patients.The prevalence of carotid plaque(s)presence was 45.6% (21.6%, 16.1% and 7.9% for 1, 2 and >2 plaque(s), respectively) and it was higher (p<0.05) in patients with IMT > 0.9 (63.1%) than in those with IMT <= 0.9mm (37.4%). The majority of plaques were located at the posterior surface of the carotid bulb (64.3%) followed by multiple locations (13.2%), internal carotid arteries (9.7%), anterior surface of the carotid bulb (9.4%) and common carotid arteries (1.9%). Moreover,the majority of plaques were isoechogenic (41.5%) followed by hyperechogenic (22.9%), mixed echogenic (21.6%) and hypoechogenic (14%). Logistic regression analysis indicated sedentary lifestyle (OR 2.7, 95%CI 1.3-5.9, p=0.011), less milk product consumption (OR 2.8, 95%CI 1.1-7.1, p=0.030), lower plasma calcium concentration (OR 2.86 95%CI 1.2-6.7, p=0.021) and increased carotid compliance (OR 1.13, 95%CI 1.02-1.25, p=0.022)as independent predictors of higher echogenicity after adjustment for age, gender, smoking, LDL-cholesterol, body surface area, 24-hour blood pressure and 24-hour heart rate. Besides, the median degree of stenosis was 20% (10-30%) while the prevalence of stenosis>50% was 2%.

Conclusions: Non-stenotic plaques of low echogenicity, predominantly located at the posterior surface of the carotid bulb are commonin middle-aged newly

diagnosed hypertensives. Physical activity, milk product consumption,plasma calcium levels and carotid wall stiffness emerge as independent determinants of calcification.

PP.35.36 RENAL RESISTIVE INDEX AS A PREDICTOR OF SUBCLINICAL CAROTID ATHEROSCLEROSIS

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Objective: Ultrasound-derived renal resistive index (RI) is used in daily clinical practice for the assessment of intrarenal hemodynamics in a variety of kidney diseases that affect renal microcirculation. Moreover, recent studies indicates that RI is an index of macrovascular atherosclerotic disease. The present study sought to evaluate the relationship between RI and carotid atherosclerosis.

Design and method: A total of 408 consecutive newly diagnosed, never treated patients with essential hypertension grade 1-3 (mean age 51±13 year, 51.8% males) referred to the outpatient antihypertensive unit of our institution were studied. Individuals with diabetes or known cardiovascular or renal disease were excluded. The evaluation of asymptomatic organ damages (including carotid plaques) was performed in accordance to the European Society of Hypertension guidelines. All participants underwent renal Doppler ultrasound and RI measurement. The mean value of RI from both kidneys was used for the analysis. According to number of carotid plaques, the study population was categorized in 4 groups: (No plaques, n=219 / 1 plaque, n=90 / 2 plaques, n=61 / >2 plaques, n=38 patients).

Results: Demographic, clinical and laboratory parameters of the 4 studied plaque-groups are presented in Table. The mean±SD RI of the study population was 0.62±0.06, (0.64±0.06 in females vs. 0.60±0.06 in males, p<0.001). The mean RI value stratified by the number of carotid plaques is also presented in Table. Ordinal logistic regression analysis revealed that RI ajdusted for age, gender, smoking status, 24-hour pulse pressure, total cholesterol and glycated haemoglobin (HBA1c) remains an independent predictor of the presence of carotid plaques (Odds Ratio 2.53, 95% CI 1.32-4.85, p=0.005).

Table	Carotid Plaques				
	No Plaque (n=219)	1 Plaque (n=90)	2 Plaques (n=61)	>2 Plaques (n=38)	p-value
Male gender, %	53.0	47.8	45.9	65.8	0.210
Age, years	47±14	53±11	56±10	62±11	<0,001
Body Mass Index, Kg/m²	28±5	29±5	28±4	29±5	0.460
Smoking Status: - *Non-Smokers*, %	49.3	36.7	36.1	26.3	0,025
- *Ex-Smokers*, %	24.2	22.2	26.2	23.7	
- *Active-Smokers*, %	26.5	41.1	37.7	50.0	
Family History of Cardiovascular Disease, %	36.3	47.2	40.7	57.9	0,050
Office Systolic Blood Pressure, mmHg	146±17	151±17	149±21	147±17	0,320
Office Diastolic Blood Pressure, mmHg	93±12	95±13	93±13	86±13	0,005
Fasting Plasma Glucose, mg/dl	94±10	95±10	100±10	97±11	0,005
HBA1c, %	5.4±0.4	5.6±0.3	5.5±0.4	5.7±0.5	0,001
Total Cholesterol, mg/dl	203±39	218±40	116±44	221±48	0,005
Glomerular Filtration Rate, ml/min	109 [88-138]	104 [83-127]	102 [86-125]	91 [73-115]	0,017
Renal Resistive Index	0.61±0.06	0.63±0.06	0.64±0.06	0.68±0.06	<0,001

Conclusions: In never treated essential hypertensive patients renal resistive index emerges as a marker of subclinical carotid atherosclerotic lesions, independent of classical cardiovascular risk factors.

PP.35.37 METABOLIC SYNDROME COMPLICATED BY STROKE

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Objective: All the information mentioned in this publication justifies the growing interest worldwide in tracking and surveillance of patients at risk of developing metabolic syndrome. The metabolic syndrome represents very important problem for the population and including a major risc for stroke. The metabolic syndrome including obesity, insulin resistance, arterial hypertension, dyslipidemia, disturbances of glucidic metabolism and is a predictor of cardiovascular diseases. Several studies have confirmed that arterial hypertension is the most frequent compound of the metabolic syndrome both in women and men. To asses the prevalence of metabolic syndrome and other main cardiovascular risk factors in a urban population from Moldova.

Design and method: The data presented here are based on emergency assistance files, through National Scientific and Practical Emergency Centre, included 400 patients with stroke (age 20 - 65 years), 150 males (37,5%) and 250 females (62,5%).

Results: Sistolic HT - 276 (69%), Diastolic HT - 240 (60%) ,Visceral obesity - 192 (48%), Diabetes mellitus- 164 (41%) , Smoking - 209 (52%), Cardiac arrhythmias 48 – (12%)
Metabolic sindrome was diagnosticated to 164 patients (41%)
In 240 patients (60%) was present only HTA.
The patients with stroke associated SM was 164 (41%):
- 53 patients (32.3%) men
- 111 patients (67.7%) women
Of the 240 patients with stroke associated only hypertension (60%):
- 139 women (55%)
- 112 were men (44.8%).

Conclusions: The results suggest that: metabolic syndrome affects 41% of the pacients and this number is permanent increased. Early diagnosis, treatment and correction of risk factors will improve the prognosis of these patients, which unfortunately still have a high mortality.

PP.35.38 ASSOCIATION OF HYPERTENSION AND OTHER CARDIOVASCULAR RISK FACTORS WITH OCCUPATIONAL OUTCOME AFTER CEREBROVASCULAR DISEASE

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Objective: To analyze the association between previous cardiovascular risk factors (CVRF) and return-to-work (RTW) after a cerebrovascular disease.

Design and method: A cohort of 485 patients who experienced an episode of sickness absence due to cerebrovascular disease was selected from the ICARIA study (Ibermutuamur CArdiovascular RIsk Assessment). The association between demographic, work-related, CVRF and RTW after a cerebrovascular disease was analyzed. Bivariate (chi-square) and multivariate (logistic regression) analyses were performed.

Results: 71.1% of the subjects returned to work after cerebrovascular disease, 26.6% received a work disability pension and 2.3% died. The median of lost working years due to work disability or death was 12 years. After multivariate analysis, the following CVRF remained associated with a higher likelihood of RTW after cerebrovascular disease: no hypertension before stroke (OR 2.49 95% CI 1.48 to 4.19); non-smoker status (OR 2.45 95% CI 1.52 to 3.95), and no previous diabetes (OR 1.96 95% CI 1.18 to 3.26), Table 1.

Table 1. Association (stepwise logistic regression) of cardiovascular risk factors and type of cerebrovascular disease with return-to-work in a cohort of workers who experienced an episode of sickness absence due to cerebrovascular diseases (n=485).

Variable	n	Crude OR (CI 95%)	p-value	n	Adjusted OR * (CI 95%)	p-value
Hypertension	454			448		
No	197	2.87 (1.82-4.50)	<0.001	194	2.49 (1.48-4.19)	0.001
Yes	257	1		254	1	
Tobacco consumption	464			458		
No	192	2.32 (1.50-3.59)	<0.001	191	2.45 (1.52-3.95)	<0.001
Yes	272	1		267	1	
Diabetes mellitus	458			455		
No	367	2.38 (1.48-3.83)	<0.001	364	1.96 (1.18-3.26)	0.009
Yes	91	1		91	1	

* Adjusted by sex, age, occupation, type of contract, level of income, relationship with working conditions and employment status at the end of sickness absence.

Conclusions: The absence of several CVRF before cerebrovascular disease, predicts higher RTW rates after the event. As far as they are significantly related to functional outcome, control of hypertension, tobacco consumption and diabetes are important aims in multidisciplinary rehabilitation, secondary and tertiary prevention programs after cerebrovascular disease.

PP.35.39 LONG-TERM ADHERENCE TO A STROKE PREVENTION PROGRAM

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Objective: Long-term adherence to clinical practice guidelines recommendations is one of the major challenges in vascular disease management. We assessed the effectiveness of a quality-of-care stroke secondary prevention program on achieving long-term adherence to drug therapy and vascular risk factor (VRF) control.

Design and method: Acute ischemic stroke patients were prospectively included in PROTEGE-ACV, a multidisciplinary secondary stroke prevention program. VRF control and drug treatment of patients with two or more years of follow-up were analyzed.

Results: We analyzed data of the 672 (67.6%) of 994 stroke patients included in the program between December 2006 and April 2013 who had two years or more of follow-up. Mean age was 74±10 years with 48% males. The main VRF were hypertension (81%), dyslipidemia (71%); overweight (48%); diabetes (14%); previous stroke or transient ischemic attack (23%); history of CHD (17%) and AF (13%), 43% were smokers or former smokers. Adherence to follow-up was 70.55% after one year and 59.4% after two years of stroke onset, remaining with optimal VRF control and high adherence to drug therapy (table). There were 97 stroke recurrences (14%) and 126 deaths (19%) after 1349 days of follow-up.

Conclusions: A multidisciplinary approach significantly improves adherence to treatment and narrows the gap between evidence-based guidelines and clinical practice. A team-work strategy could be a key factor to improve long-term compliance, with impact on mortality and recurrence.

Variable	One year	Two years	p
Vascular Risk Factor			
SBP (mmHg)	128±13	127±14	NS
DBP (mmHg)	76±8	75±8	NS
PP (mmHg)	52±11	51±12	NS
Fasting glucose (mg/dL)	97±20	100±19	0.01
Total cholesterol (mg/dL)	162±34	162±33	NS
HDL-C (mg/dL)	50±14	50±15	NS
LDL-C (mg/dL)	90±7	89±26	NS
Tryglicerides (mg/dL)	100±49	102±50	NS
Drug therapy (% of patients)			
Antihypertensives	91%	91%	NS
Statins	92%	92%	NS
Antiplatelet	82%	81%	NS
Oral anticoagulants	23%	26%	NS

PP.35.40 PATHOGENETIC CORRECTION OF MODERATE COGNITIVE DISORDERS IN PATIENTS WITH ARTERIAL HYPERTENSION

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Objective: Possibilities of dopamine agonist in the pharmacological correction of moderate cognitive disorders in patients with arterial hypertension.

Design and method: 115 patients with arterial hypertension and moderate cognitive disorders (mean age – 67,3±2,9 y.o., m-52 %, f.-48 %) were included into the study. All patients have been divided into 4 groups: 1st group (n=30) received base therapy of arterial hypertension and piribedil in total daily dose 50 mg, 2nd group (n=27) received base therapy of arterial hypertension, piribedil and different vasoactive drugs, 3st group (n=28) received base therapy of arterial hypertension and different vasoactive drugs and 4st group (n=30) received only base therapy of arterial hypertension during 12 weeks. Intensity Mini Mental State Examination (MMSE) and Montreal Cognitive Assessment (MoCa) were estimated before and after the treatment.

Results: The mean score of MMSE was 25,8 ±1,0, 25,7 ±0,8 and 25,9±1,1 in patients 1st , 2nd and 3st groups, respectively. The mean score of MoCa was 24,9±0,7, 24,5±0,4 and 24,7±0,3 in patients 1st , 2nd and 3st groups, respectively. The Patients in 4st group has mean score of MMSE 25,4±0,9, of MoCa-24,8±0,4. After 12 weeks of treatment of piribedil the increase of mean score of MMSE up 7 and 9 % ($p<0,05$, $p<0,05$) was revealed in patients 1st and 2st group respectively. Also the increase of mean score of MoCa up 9 and 9,5 % ($p<0,05$, $p<0,05$) was revealed in patients 1st and 2st group respectively. There were no founded such changes in patients 3 nd group and 4 nd group ($p>0,05$, $p>0,05$).The tolerance of piribedil was satisfactory, adverse event (headache, vertigo, sleepiness, dyspepsia) were non-seriously and not required the cancel of piribedil.

Conclusions: Piribedil in total daily dose 50 mg authentically improves cognitive functions of patients with arterial hypertension.

PP.35.41 PREDICTED VALUE OF CIRCULATING VASCULAR ENDOTHELIAL GROWTH FACTOR-1 CHANGING IN ARTERIAL HYPERTENSION PATIENTS AFTER ACUTE ISCHEMIC STROKE

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Objective: To investigate the predictive value of the circulating vascular endothelial growth factor-1 (VEGF-1) level measured repeatedly in hypertensive patients after acute ischemic stroke.

Design and method: The study included 102 patients with mild to moderate arterial hypertension, who were evaluated within a 3-week post ischemic stroke period. The circulating VEGF-1 level was assessed at baseline and in six months after stroke. Clinical interviews were carried out monthly for a year after stroke. The following are cardiovascular outcomes defined as clinical events: recurrent stroke or transient ischemic attack (TIA), ischemic heart disease, sudden death, diabetes mellitus, cardiovascular events, including chronic heart failure and the need for hospital admission for those reasons.

Results: The analysis showed an increase in the VEGF-1 concentration, which was associated obviously with the incidence of cardiovascular events within six months after an ischemic stroke when compared with the individuals without an increase in circulating VEGF-1 levels. Adjusted odds ratio (OR) for the occurrence of cumulative cardiovascular events in hypertensive patients whose VEGF-1 levels were over 403.57 pg/ml at baseline in comparison with OR in those whose VEGF-1 levels were lower, was equal to 4.11 (95% CI=2.66-7.28; P=0.001). In sixth months, the higher circulating VEGF-1 level was over 450.15 pg/ml in the patients who had its level elevated at baseline in comparison with those who had its level lower at baseline, with the higher VEGF-1 level associated with adjusted odds ratio of 5.46 (95% CI =3.12-7.90; P=0.001).
Defined by serial measurements, adjusted OR for the occurrence of cumulative cardiovascular events in hypertensive patients with increased circulating VEGF-1 level was 6.10 (95% CI = 4.70-8.30, P = 0.001) versus the individuals without such a change in VEGF-1 level.

Conclusions: We found that incremented circulating VEGF-1 level was an independent predictor of cumulative cardiovascular events in hypertensive patients within a year after an ischemic stroke. This assumption needs to be confirmed in studies of greater statistical power.

PP.35.42 MANAGEMENT OF HYPERTENSIVE CRISES WITH TRANSIENT NEUROLOGICAL SYMPTOMS IN BULGARIAN IN-HOSPITAL POPULATION. RETROSPECTIVE STUDY

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Objective: The aim of the study was to analyze the management treatment and prognosis of patients with hypertensive crisis (HC) and transient neurological symptoms.

Design and method: 62 patients (32 men and 30 women) aged 42-86 (mean age 61,27±12) hospitalized in a Neurological Clinic in Sofia because of HC (acute increase of systolic blood pressure > 180 and/or diastolic > 120 mm Hg) with acute transient neurologic symptoms (headache, dizziness, vomiting, seizures, vision disturbancies) were analyzed retrospectively. The history included cardiac and neurological diseases, diabetes, dyslipidemia. Laboratory tests were taken and CT scan performed to exclude stroke. Blood pressure (BP) measurements were recorded at admittance and at regular intervals during the hospital stay and at dissmission.

Results: The average systolic blood pressure (SBP) at the beginning of the HC was 199.79 ±17.31 , the average diastolic blood pressure (DBP) – 113.59 and the mean arterial pressure (MAP) – 142,32 mm Hg. The patients were treated with neurological and antihypertensive agents according to the individual judgement of neurologist and consulting cardioliogist on the basis of the patients condition and the level of BP. BP was successfully lowered significantly in the next hours and days. At the 2 nd hour after the beginning MAP was reduced by 16.06% , at the 6 th hour – by 17.9% , at 12 th hour – by 26.35% , at 24 th hour – by 24.25% , at 48 hour – by 26.43% , on the 3 rd day – by 28,86%, on 4 th day-by28,98% and at dissmission – by 29,26%. On the day of dissmission half of the patients were with normalized BP (< 140/90 mm Hg). All patients were dehospitalized stable. 50% were treated with intravenous antihypertensive agents, the others – with oral. All antihypertensive classes were used at individual choice.

Conclusions: In conclusion HC with transient neurologic symptoms can be successfully managed if treated promptly and adequately with the available drugs and the close prognosis is good.

PP.35.43 PREDICTORS OF NON COMPLIANCE TO LONG-TERM FOLLOW-UP IN ISCHEMIC STROKE

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Objective: As stroke is a major public health problem, early identification of potential barriers for noncompliance to long-term follow-up is crucial in decision making regarding care provision. We assessed clinical variables related to non adherence to a quality-of-care stroke secondary prevention program.

Variable	Compliance (n 364)	No compliance (n 263)	p
Age (years)	73±10	75±10	0.003
Age > 80 %(n)	33 (123)	47 (124)	0.001
DM %(n)	11 (39)	18 (47)	0.01
CI (MMSE) %(n)	10 (35)	18 (44)	0.005
MMSE	27±2	16±3	0.008
m-Rankin >1 %(n)	18 (66)	29 (74)	0.001
Barthel index	95±9	92±14	0.0005
Barthel index <90 %(n)	11 (40)	20 (53)	0.001
Multivariate analysis			
	OR	**95% CI**	**p**
Age > 80	1.56	1.11-1.21	0.01
DM	1.96	1.21-3.26	0.005
Barthel index <90	1.80	1.12-2.89	0.01
CI (MMSE)	1.73	1.10-2.82	0.01

Design and method: Acute ischemic stroke patients were prospectively included in PROTEGE-ACV, a multidisciplinary secondary stroke prevention program. Demographic data, vascular risk factors profile and control, cognition (MMSE adjusted by age and educational status and Clock-drawing test) and functionality (modified Rankin scale, Barthel index, Geriatric Depression scale) were evaluated at the inclusion visit one month after the event. These variables were analyzed in two groups of patients: 1) those with clinical follow-up after two years of stroke (compliance) and 2) those non adherent to clinical follow-up (no compliance).

Results: We analyzed data of the 672 (67.6%) of 994 stroke patients included between December 2006 and April 2013 whose admission to the program has been made at least two years before; 263 (39%) were non compliant to scheduled visits. These patients were older, had higher incidence of diabetes (DM), cognitive impairment (CI) and disability one month after stroke. After multivariate analysis, age > 80 years, DM, disability evaluated by Barthel index and cognitive impairment remained as predictors of long-term non compliance after stroke. (Table)

Conclusions: Identifying barriers to adherence is mandatory in order to recognize opportunities of improvement and develop strategies for clinical care in this specific subgroup of patients. In our cohort these barriers are mainly related with disability; interaction with care providers, home care and facilitated access to hospital visits could be the way to cope with this problem.

PP.35.44 THE RELATIONSHIP OF HEART RATE VARIABILITY AND THE STRUCTURAL FEATURES OF CEREBROVASCULAR DISEASE IN PATIENTS WITH RESISTANT HYPERTENSION

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Objective: The disbalance of links of autonomic nervous system with increase of activity sympathetic and decrease a parasympathetic part is one of pathogenetic mechanisms of occurrence and formation hypertension, ischemic heart disease, heart failure. The relationship between the autonomic nervous system and structural pathology of a brain in hypertensive patients is not fully disclosed. The aim was to study heart rate variability and the structural features of cerebrovascular disease in patients resistant hypertension.

Design and method: We examined 49 asymptomatic, non complicated resistant essential hypertensives, aged between 26-57 years. All patients underwent clinical exam, 24-hour Holter ECG monitoring and magnetic resonance (MRI) a brain. 24-hour Holter ECG monitoring was recorded using Meditech Cardiotens Holter System. The analysis of heart rate variability (HRV) included spectral parameters: total spectral power, low frequency (LF) and high frequency (HF) values and time parameters: SDNN, pNN50%, RMSSD, HRVti. Magnetic resonance imaging was performed using Magnetom-Open with main field strength of 0.2 T.

Results: In patients with resistant hypertension were significantly more frequent structural disorders of cerebrovascular disease (disorders liquorodynamics in 100%, leucoaraiosis in 85%, asymptomatic ischemic white matter lesions in 70% patients). In resistive hypertensive patients with leucoaraiosis (LA) is noted significant decrease in the HRV (SDNN 128,9 and 170,5 ms accordingly; p=0,025), reduction rMSSD (22,6 and 39,5 ms accordingly; p=0,000), pNN50 (3,8% and 13,3% accordingly; p=0,000), contribution HF to the total spectral power (7% and 21% accordingly; p=0,000), that reflects reduction of activity parasympathetic department. Positive correlation between the parameters describing sympathetic activation (LF: R=0,906, p=0,005; LF/HF: R=0,790, p=0,034) and depth of LA is revealed.

Conclusions: Our results showed that in resistive hypertensive patients with leucoaraiosis decrease in the HRV and activity of parasympathetic department is revealed, increase of activity of a sympathetic tone is marked.

POSTERS' SESSION

POSTERS' SESSION PS36
COMBINATION TREATMENT

PP.36.01 REGULATION OF UNCONTROLLED BLOOD PRESSURE WITH THE FIXED-DOSE COMBINED DRUG PRESTANCE: RESULTS OF THE PRIORITY STUDY

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Objective: The aim of this study was to assess the efficacy and safety of blood pressure (BP) control with a fixed-dose combination of perindopril arginine/amlodipine (Prestance) in patients with uncontrolled hypertension.

Design and method: A total of 547 patients with uncontrolled hypertension from the PRIORITY" (PRestance – arterial hypertension efficacy evaluatIOn with newly diagnosed and uncontRolled patIents sTudY) database were included. At the beginning of the study the patients (mean age 63.0±10.1 years; 185 men) were switched from antihypertensive drugs that had proven ineffective in BP control to Prestance. BP was measured in the first, third, and sixth months of the study. The primary end point was the number of patients reaching target BP levels in the intermediate phases of the study. During each visit the patients were asked about the tolerability and adverse effects of Prestance. The SPSS v17.0 statistical software package was used for data collection and analysis. Results are presented as mean value±standard deviation. Differences in mean values were analyzed using Student's "paired-simple" test.

Results: Mean systolic BP (SBP)/diastolic BP (DBP) declined significantly from 167.7±17.7/98.1±10.7 mm Hg to 130.8±11.3/80.6±5.9 mm Hg (P<0.0001) over the course of the study. SBP/DBP reduction at one month was already -23.4±16.0/-9.0±9.9 mm Hg (P<0.0001). Patients with blood pressure values at target (<140/90 mm Hg) represented 27% of the patients at one month, 50% at 3 months and 70% at 6 months. At the end of study, Prestance was prescribed in 38.6% (perindopril arginine/amlodipine; 5 mg/5 mg), 28.5% (10 mg/5 mg), 8.6% (5 mg/10 mg), and 24.3% (10 mg/10 mg) of cases, respectively. No adverse effects were observed. 97% of the patients assessed the tolerability of perindopril arginine/amlodipine as "good" or "very good".

Conclusions: The fixed-dose combination of perindopril arginine/amlodipine was effective in patients with uncontrolled hypertension in reducing BP and maintaining it at target levels. Tolerability and safety were satisfying over the six months of the study.

PP.36.02 MORTALITY IN HYPERTENSIVE PATIENTS WITH CORONARY HEART DISEASE DEPENDS ON CHRONOPHARMACOTHERAPY AND DIPPING STATUS

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Objective: The efficacy of hypertension medications is strongly related to their pharmacokinetic and pharmacodynamic properties, and the associated frequency of administration. The goal of our study was to assess the influence of hypertension chronopharmacotherapy on diurnal blood pressure (BP) profile and mortality.

Design and method: Subjects with established coronary heart disease (CHD) (n=1345, mean age 63.2±9.2 years) were included. Clinic blood pressure measurement was performed and 24-hour ambulatory BP monitoring was obtained with BP readings set at 20-minute intervals (06:00 AM – 06:00 PM) and at 30-minute intervals (06:00 PM – 06:00 AM). The percentage decrease in mean BP during the nighttime period was calculated as 100x[daytime BP mean – nighttime BP mean]/daytime BP mean. Using this percentage ratio, subjects were classified as dippers or non-dippers (nighttime relative BP decline >=or <10%, respectively). There has been no change in antihypertensive pharmacotherapy for all included patients in the six month period before inclusion. The present study is a part of PROGNOSIS study.

	Total group n=1345	Dippers n=600	Non dippers n=745	p
ASA, n	1052 (78%)	456 (76%)	596 (80%)	ns
Lipid-lowering drugs, n	1230 (91%)	552 (92%)	678 (91%)	ns
Nitrate, n	420 (31%)	174 (29%)	246 (33%)	ns
β-blockers, n	1033 (77%)	444 (74%)	589 (79%)	ns
Calcium channel blockers, n	336 (25%)	150 (25%)	186 (25%)	ns
ACE-I, n	982 (73%)	438 (73%)	544 (73%)	ns
ARBs, n	61 (4%)	24 (4%)	37 (5%)	ns
Diuretics, n	167 (12%)	78 (13%)	89 (12%)	ns
α-blockers, n	55 (4%)	18 (3%)	37 (5%)	ns
Other medications, n	100 (7%)	48 (8%)	52 (7%)	ns
One medication, n	344 (26%)	150 (25%)	194 (26%)	ns
Two medications, n	677 (50%)	312 (52%)	365 (49%)	ns
Three or more medications, n	324 (24%)	138 (23%)	186 (25%)	ns
Two or more medications with diuretic, n	196 (15%)	84 (14%)	112 (15%)	ns
Median of medications	2	2	2	ns
Only morning administration of drugs, n	664 (50%)	180 (30%)	484 (65%)	<0.01
Only evening administration of drugs, n	138 (10%)	78 (13%)	60 (8%)	ns
Twice a day administration of drugs, n	272 (20%)	168 (28%)	104 (14%)	<0.03
Three or more times a day administration of drugs, n	271 (20%)	174 (29%)	97 (13%)	<0.01

ASA-acetylsalicylic acid, lipid lowering drugs include statins and fibrates, ACE-I – inhibitors of angiotensin converting enzyme, ARBs-angiotensin receptor blockers.

Results: The median follow-up period was 6.6 years (interquartile range 6.1 to 7.1 years). Antihypertensive treatment is presented in table. Non-dipping status was related to a lack of nighttime hypertensive drug administration (OR 3.87, 95%CI 3.00-4.98). In a Cox proportional hazards regression model, non-dipping status (HR 1.17, 95%CI 1.02-1.47) and non-nighttime antihypertensive drug administration (HR 1.13, 95% CI 1.01-1.45) were predictors of all-cause mortality.

Conclusions: The non-dipping profile of CHD patients and increased mortality were related to a lack of antihypertensive drug administration at bedtime.

PP.36.03 EFFECTIVENESS OF COMBINATION THERAPY WITH ZOFENOPRIL AND HYDROCHLOROTHIAZIDE COMPARED TO ZOFENOPRIL MONOTHERAPY IN PATIENTS WITH ESSENTIAL HYPERTENSION

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Objective: The aim of present study was to compare the effects of zofenopril (Z) and hydrochlorothiazide (H) in low-dose combination vs Z monotherapy on blood pressure (BP),left ventricular (LV) hypertrophy and LV diastolic function in patients with essential hypertension.

Design and method: Fifty six patients with mild to moderate essential hypertension with LV hypertrophy (LV mass index >= 125 g/m2 for men and >= 110 g/m2 for women) and diastolic dysfunction were randomly assigned to Z 15 mg and H 12,5 mg in combination once a day (15 males and 13 females – group A) or Z 30 mg once a day (16 males and 12 females – group B). Doppler – and 2 – dimensional echocardiography were performed at baseline and after 12 months of therapy. The parameters of LV hypertrophy, ratio of the early filling velosity (E) to the late filling velosity (A) – E/A ratio, isovolumic relaxation time (IVRT) and deceleration time (DT) were evaluated. LV mass index (LV mass/body surface area) was calculated according to Devereux formula.

Results: All patients concluding the study without showing intolerance or side effects to the drugs.BP was lowered to less than 140/90 mm Hg in 92,9% of the patients of group A and in 89,3% of the patients of group B. At the end of the study LV mass index reduced from 163,5±6,7 to 133,8±3,4 g/m2 in group A, p<0,01, from 165,4±6,4 to 141,9±3,3 g/m2 in group B, p<0,05. At the end of the study E/A ratio increased from 0,94±0,03 to 1,35±0,02 in group A, p<0,001 and from 0,96±0,03 to 1,25±0,04 in group B, p<0,001. IVRT decreased from 105,1±5,9 to 73,6±3,1 msec in group A, p<0,01 and from 101,4±6,0 to 77,7±5,0 msec in group B, p<0,05. DT passed from 168,2±8,1 to 129,3±3,5 msec in group A, p<0,01 and from 169,4±8,3 to 136,1±3,9 msec in group B, p<0,05.

Conclusions: BP control was stable and effective in both groups. Compared to Z monotherapy, combining antihypertensive drugs with complementary mechanisms of action (Z and H) demonstrated more pronounced regression of LV hypertrophy and improvement of LV diastolic function.

PP.36.04 EFFICACY OF TREATMENT WITH VALSARTAN IN PATIENTS WITH ISOLATED SYSTOLIC HYPERTENSION AND REDUCED LEFT VENTRICULAR SYSTOLIC FUNCTION TAKING RAMIPRIL

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Objective: Left ventricular (LV) systolic dysfunction is a widespread complication of arterial hypertension. Mortality and morbidity among patients with isolated systolic hypertension (ISH) and reduced LV systolic function remain high. The aim of this study was to compare the effect of treatment with combined angiotensin-converting-enzyme (ACE) inhibitor ramipril (R) and angiotensin II receptor blocker valsartan (V) or ACE inhibitor R monotherapy on LV mass index (LVMI) and systolic function in patients with ISH.

Design and method: Fifty two patients with mild to moderate ISH, LV hypertrophy (LVMI >= 125 g/m² for men and >= 110 g/m² for women) and LV systolic dysfunction (ejection fraction-EF=40% or lower) were treated with ACE inhibitor R at a constant dose (10 mg once a day) for 30 days or longer. 26 patients,aged 60-68 years (group A),were randomly assigned to receive 80 mg of V daily;26 patients,aged 59-67 years (group B),were treated only with R until the end of the study. Echocardiography was performed at baseline and after 12 months of therapy.LVMI and parameters of LV systolic function [EF,endocardial and midwall fractional shortening (end FS and mid FS)] were calculated.Differences in the efficacy parameters were analysed using 2-tailed Student's t test for quantitative parameters.

Results: At the end of the study systolic BP was lowered in both groups to less than 140 mm Hg.LVMI decreased from 166,4±5,2 to 130,4±4,2 g/m² in group A (p<0,001),from 165,2±5,4 to 141,4±4,1 g/m² in group B (p<0,01).EF increased [54,1±2,2 vs 37,4±1,1% in group A (p<0,001),49,5 ±2,2 vs 38,2±1,3% in group B (p<0,01)].End FS and mid FS also increased at the end of the study [40,1±1,1 vs 26,8±1,2% and 23,5±0,5 vs 14,5±0,3 %,respectively in group A(p<0,001);36,4±1,4 vs 28,1±1,3% and 20,4 ±0,6 vs 16,6±0,5%,respectively in group B(p<0,01)].

Conclusions: The combined therapy with R and V showed greater effects on LV structure and function compared to monotherapy with R in patients with ISH. Consequently,treatment with combined ACE inhibitors and angiotensin II receptor blockers might have advantages over ACE inhibitor monotherapy.

PP.36.05 VECTOR NATIONAL RESEARCH PROJECT. EPIDEMIOLOGICAL STUDY OF PATIENTS WITH CORONARY ARTERY DISEASE AND ARTERIAL HYPERTENSION

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Objective: The purpose of this study was to identify the prevalence of CAD combined with AH and assess the quality of BP control in this population.

Design and method: The Vector study enrolled 1222 patients (640 males, 582 females) with AH on outpatient observation. 73 therapists and cardiologists participated in the study. Based on international recommendations, both angiotensin-converting enzyme (ACE) inhibitors and calcium channel blockers (CCB) are recommended for patients with hypertension and stable angina pectoris. Patients were therefore prescribed a single-pill combination of perindopril/amlodipine at any registered dose and were seen again after one month.

Results: Among patients with hypertension, 72% had CAD. Mean systolic and diastolic BP were 168.6 ± 19.02 mm Hg and 98.2 ± 10.81 mm Hg, respectively, at baseline. The main doses of perindopril/amlodipine prescribed to patients at the first visit were 5/5 mg (36.4%), 10/5 mg (29.3%), and 10/10 mg (19%). In 54.3% of cases, patients were also receiving concomitant antihypertensive treatments, mostly β-blockers and diuretics. After one month, patients initiated with perindopril/amlodipine had a reduction in systolic BP of 33 mm Hg (from 168.6 ± 19.02 to 134.4 ± 13.66 mm Hg, P<=0.0001) and a reduction in diastolic BP of 14.7 mm Hg (from 98.2 ± 10.81 to 83.43 ± 7.91 mm Hg, P<=0.0001). Systolic BP was controlled in 63.3% of patients and diastolic BP in 69.4% of them within one month. Interestingly, patients previously receiving a combination of angiotensin receptor blocker (ARB)/diuretic or ARB/CCB had respective reductions in SBP/DBP of -35/16 mm Hg and -32/11 mm Hg. Perindopril/amlodipine was discontinued in only 8 patients (0.6%) due to adverse effects: edema of the lower extremities in 6 patients (0.5%) and cough in 2 patients (0.16%). General perception of the treatment was classified as "excellent" by 74 patients (6%), "good" by 342 patients (28.2%), and "satisfactory" by 798 patients (65.3%).

Conclusions: The single-pill combination of perindopril/amlodipine was well tolerated and provided a fast reduction in BP for high-risk patients combining hypertension and CAD, especially for those not previously controlled by other combinations.

PP.36.06 SAFETY, TOLERABILITY, COMPLIANCE AND EFFECTIVENESS OF A FIXED-DOSE COMBINATION OF OLMESARTAN AND AMLODIPINE IN CLINICAL PRACTICE

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Objective: To assess safety, tolerability and effectiveness of a fixed-dose combination of Olmesartan/Amlodipine (OLM/AML), and patient compliance in a population of treated not at goal hypertensive patients under normal conditions in daily practice in Belgium.

Design and method: A multicenter, non-interventional, non-controlled observational study with 2939 hypertensive patients seen by 829 physicians in daily practice. Blood pressure (BP) reduction, comorbid disease, pharmacotherapy, safety, tolerability and compliance were documented over a 12–18 (26)-week observational period.

Results: Patients had a mean age of 63.6 ± 12.0 years, 48.1% were 65 years or older, 46.0 % were female, and 71.4 % had at least one comorbid cardiovascular risk factor or condition. In total, 44.7 % received OLM/AML 20/5 mg, 42.8 % received 40/5 mg, and 12.5 % received 40/10 mg at baseline, mostly because of lack of effectiveness on prior antihypertensive therapy (86.7 %). Mean BP at baseline was 160.5 ± 15.3/92.6 ± 9.9 mmHg (53.0 % had grade 2 or 3 hypertension), and the observed mean BP reduction was -26.0 ± 15.8/-12.2 ± 10.2 mmHg. A similar BP reduction in patients younger or older than 65 years was seen. At the final visit, 49.5 % (3.4 % at baseline) were controlled (<140/90 mmHg and <130/80 mm Hg in diabetic or high-risk patients). Adverse drug reactions were observed in 3.7 % of the study population; 68% of these adverse drug reactions were judged as non-serious events, and 33% of all adverse drug reactions reported were peripheral edema. In only 1.6% of patients, compliance was judged by the physicians as insufficient. In the majority of patients (94.4%) compliance was regarded to be very good or good.

Conclusions: The fixed-dose OLM/AML combination was well tolerated, safe and effective in a population of hypertensive patients not at goal in daily practice. Compliance to the treatment was high. These results confirm prior randomized controlled trial evidence.

PP.36.07 LONG-TERM SAFETY OF FIXED-DOSES: AZILSARTAN MEDOXOMIL/CHLORTHALIDONE VS OLMESARTAN MEDOXOMIL/HYDROCHLOROTHIAZIDE IN HYPERTENSIVE SUBJECTS WITH STAGE 3 CHRONIC KIDNEY DISEASE

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Objective: In chronic kidney disease (CKD), deteriorating renal function can accompany effective blood pressure (BP) control, especially with RAAS-blocker/diuretic combinations. This open-label study evaluated long-term safety/tolerability of fixed-dose combination (FDC) azilsartan medoxomil/chlorthalidone (AZL-M/CLD) vs FDC olmesartan/hydrochlorothiazide (OLM/HCTZ) in hypertensive subjects (clinic systolic BP [SBP] 135-160 mmHg on stable doses of 2-3 antihypertensives) with stage 3 CKD (eGFR 30 to <60 mL/min/1.73 m²).

Design and method: Subjects discontinued antihypertensive medications 2 days before randomization. Initial therapy was AZL-M/CLD 20/12.5 mg qd (n=77) or OLM/HCTZ 20/12.5 mg qd (n=76). If BP was not reduced to <130/80 mmHg, doses could be up-titrated (AZL-M/CLD to 40/25 mg; OLM/HCTZ to 40/25 mg [US] or 20/25 mg [Europe]) and other agents (except ARBs and diuretics) added during wks 4–52. Primary endpoint was proportion of subjects with >=1 adverse event (AE) through Week 52.

Results: Groups were generally similar at baseline (mean age 68 yr, BP 150/85 mmHg, eGFR 48 mL/min/1.73 m2, 42% diabetes). Seventeen (22.1% AZL-M/CLD and 15 (19.7%) OLM/HCTZ subjects discontinued for AEs. AZL-M/CLD showed greater SBP reductions before titration (wks 2 and 4), then similar or numerically slightly greater reductions (wks 4-42),

with similar mean [SD] change from baseline at final visit (24.3 [16.10] mmHg for AZL-M/CLD, 23.7 [11.30] mmHg for OLM/HCTZ). DBP reductions were generally similar between groups. More OLM/HCTZ than AZL-M/CLD patients were on highest study drug dose (48.7% vs 29.9%) and were taking additional antihypertensives (26.3% vs 16.9%) at study end.
AEs occurred in 88.3% of AZL-M/CLD vs 76.3% of OLM/HCTZ patients. Serious AEs were reported in 10.4% (AZL-M/CLD) vs 11.8% (OLM/HCTZ). One death (pulmonary artery thrombosis) occurred with OLM/HCTZ. Common AEs (AZL-M/CLD vs OLM/HCTZ) were blood creatinine increased (44.2% vs. 38.2%), dizziness (7.8% vs. 6.6%) and headache (10.4% vs. 2.6%). Similar proportions of subjects had consecutive SCr elevations >=50% from baseline and >ULN or eGFR <=20 mL/min/1.73 m² (5.3% AZL-M/CLD, 5.4% OLM/HCTZ).

Conclusions: In a titrate-to-target BP study in hypertensive subjects with stage 3 CKD, AZL-M/CLD and OLM/HCTZ showed comparable long-term safety/tolerability.

PP.36.08 COMPARE THE TWO THERAPEUTIC COMBINATIONS OF ARB WITH DIURETIC

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Objective: Angiotensin Receptor Blocker (ARB) and Calcium Channel Blocker (CCB) will be listed as the first choice therapeutic drugs in the Guideline of Japanese Society of Hypertension (JSH) 2014. In JSH guideline, Diuretics (DU) was listed as the second choice drugs, but it has a major side effect to increase the Uric Acid (UA) levels. And previous study showed that increasing UA was an independent risk factor for cardiovasculardisease. Although the combination therapy ARB with DU is common in every nation, it is not clear the affinity for Hypertensin what the best combination which ARB with which DU. Here, we show that compare the two therapeutic combination Valsartan (VAL) with Hydrochlorothiazide (HCTZ) and Irbesartan (IRB) with Trichlormethiazide (TCTZ).

Design and method: 40 patients with essennstial hypertension without diabetes mellitus aged 50 to 80 year old were first prescribe 80mg VAL, next randomly allocated to VAL with HCTZ or IRB with TCTZ. Blood exams were checkd at before and after 1 month single medication of VAL, and 3 months after changed to ARB with DU. (VAL + HCTZ or IRB + TCTZ, the significant difference between both groups were not seen).

Results: Through an observation period, we did not recognize the significant difference to the blood pressure of both groups. Significant difference was recognized only to the UA level three months after the dosage of ARB with DU, the group using IRB with TCTZ was a low value for significant difference from VAL with HCTZ.

Conclusions: Our conclusion was we should have pay attention to UA levels increasing by using of ARB with DU, because increasing UA was independent risk factor for cardiovascular disease.

PP.36.09 EFFECTS OF ADDING THIAZIDE TO RENIN-ANGIOTENSIN BLOCKER REGIMEN ON CALCIUM METABOLISM AND BONE MINERAL DENSITY IN ESSENTIAL HYPERTENSION

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Objective: Thiazide can increase bone mineral density (BMD) and reduce bone fracture. In this study, the effects of hydrochlorothiazide on calcium metabolism and BMD were investigated following adding hydrochlorothiazide to renin-angiotensin (RA) blocker in essential hypertensives (EHT).

Design and method: RA blocker was switched to combination drug of losartan 50 mg and hydrochlorothiazide 12.5 mg (L/H) in 17 EHT who had not achieved their treatment goals with monotherapy of RA blockers. Renal calcium handling, calcium metabolism and BMD measured by dual energy X-ray absorptiometry were evaluated before and 12 months after the start of treatment with L/H.

Results: After the treatment with L/H, blood pressure significantly decreased and attained to the treatment goals in all of EHT. Following the treatment with L/H, serum corrected calcium increased (9.12±0.07 to 9.31±0.10 mg/dL) with a reduction in fractional excretion of calcium (0.60±0.07 to 0.44±0.08 %), although serum level and renal handling of phosphate were unchanged. Serum intact parathyroid hormone and serum alkaline phosphatase also decreased (52±5 to 47±5 pg/mL, 216±19 to 171±7 IU/L, respectively). BMD at lumbar spine L2-4 and femoral neck increased after the L/H treatment (1.201±0.05 to 1.25±0.05 g/cm², 0.896±0.03 to 0.918±0.03 g/cm², respectively). Additionally, the L/H-induced changes in BMD was correlated positively with those in serum corrected calcium ($r= 0.484$, $p< 0.05$).

Conclusions: These data indicate in EHT, adding of hydrochlorothiazide to RA blocker can increase BMD via the modification of renal calcium handling and calcium metabolism as well as potentiate the antihypertensive effects of RA blocker.

PP.36.10 THE EFFICACY AND SAFETY OF AMLODIPINE 5MG/LOSARTAN 100MG VS. LOSARTAN 100MG/HYDROCHLOROTHIAZIDE 12.5MG FIXED DOSE COMBINATION IN HYPERTENSIVE PATIENT UNRESPONSIVE TO LOSARTAN 100MG

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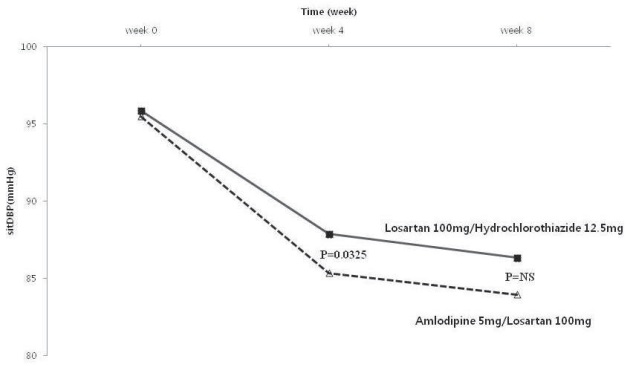
Objective: The aim of this study was to determine whether the efficacy and safety of Amlodipine 5mg/Losartan 100mg daily are similar to those of Losartan 100mg/Hydrochlorothiazide 12.5mg daily in hypertensive patients unresponsive to losartan 100mg monotherapy.

Design and method: 275 patients were screened in 9 cardiovascular centers, 199 were enrolled (Amlodipine 5mg/Losartan 100mg group (N=101; group A), Losartan 100mg/Hydrochlorothiazide 12.5mg group (N=98; group B)), and 183 patients completed the study. Primary end point was change in 8 week sitDBP from baseline and the secondary end points were changes in 4 week sitDBP, changes in 4 and 8 week sitSBP, and blood pressure response rate. Safety was evaluated using adverse events, laboratory data, vital signs, and ECG findings.

Results: Demographic characteristics were similar in the two groups (mean age 51.56 ± 9.97 years, male 70.53%). At 8 weeks after randomization, the change of sitDBP from baseline was -11.54 ± 7.89 mmHg in the Amlodipine 5mg/Losartan 100mg group ($P<0.0001$) and -9.05 ± 6.57 mmHg in Losartan 100mg/Hydrochlorothiazide 12.5mg group ($P<0.0001$). The mean difference between two groups was -2.57 mmHg, which meant the Amlodipine 5mg/Losartan 100mg group was non inferior to the Losartan 100mg/Hydrochlorothiazide 12.5mg group. Uric acid level at 8 weeks was depressed in the Amlodipine 5mg/Losartan 100mg group (- 0.12 ± 0.82 mg/dL) but elevated in Losartan 100mg/Hydrochlorothiazide 12.5mg group (0.41 ± 0.80 mg/dL, $P<0.0001$) as compared with baseline level, and this represented a significant intergroup difference. Thirty eight patients (19.39%, 19 in the Amlodipine 5mg/Losartan 100mg group, and 19 in the Losartan 100mg/Hydrochlorothiazide 12.5mg group) experienced an adverse event but treatment related adverse event was 7.

Conclusions: The efficacy and safety of amlodipine 5mg/losartan100mg daily was found to be non-inferior to those of losartan 100mg/hydrochlorothiazide 12.5mg daily in hypertensive patients unresponsive to losartan 100mg monotherapy.



PP.36.11 BLOOD PRESSURE REDUCTION AND ARTERIAL DE-STIFFENING EFFECTS OF COMBINED ANTIHYPERTENSIVE TREATMENT WITH RAMIPRIL AND AMLODIPINE

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Objective: Approximately 30-45% of the general population in Europe suffers from arterial hypertension (AH) and the majority of these patients would need a combined antihypertensive treatment to reach target blood pressure (BP) values. One of the preferred first line antihypertensive strategies is the combination of an angiotensin-converting enzyme inhibitor (ACEi) and a calcium channel blocker (CCB).

Design and method: We included prospectively 48 patients (mean age 54 ± 15 years, 38% women) with AH and followed them up for 2.7 months (1-7 months) in order to evaluate the effect of a fixed antihypertensive combination ramipril + amlodipine on BP and arterial stiffness (AS) parameters. We measured office and 24-hour ambulatory BP and AS indices at baseline, at 1st month and at the end of follow-up.

Results: At the end of follow-up office and ambulatory values of systolic and diastolic BP (SBP; DBP) decreased significantly, although the dipping status remained unchanged - table 1.

Parameter	Baseline	Follow-up	(p)
SBP (mmHg)	161 ± 20	130 ± 12	< 0.001
DBP (mmHg)	103 ± 10	83 ± 7	< 0.001
Holter RR SBP 24 hours (mmHg)	140 ± 11	125 ± 13	0.001
Holter RR DBP 24 hours (mmHg)	85 ± 10	75 ± 10	0.005
Holter RR SBP day (mmHg)	146 ± 13	129 ± 14	0.001
Holter RR DBP day (mmHg)	86 ± 9	77 ± 10	0.003
Holter RR SBP night (mmHg)	125 ± 14	115 ± 13	0.019
Holter RR DBP night (mmHg)	74 ± 10	68 ± 7	0.039
Values above limit SBP day (%)	59%	25%	0.01
Values above limit DBP day (%)	49%	24%	0.025
Values above limit SBP night (%)	54%	28%	0.015
Values above limit DBP night (%)	60%	18%	0.001
Dipping % SBP	18.9%	12.6%	ns
Dipping % DBP	11.5%	13.7%	ns

AS analysis showed improvement of elastic properties of vessel wall (de-stiffening): Pulse wave velocity decreased from 7.5 to 6.4 m/s, p<0.001 and augmentation index was reduced from 17.6 to 9.7%, p<0.001. The positive effects on BP and arterial elasticity were present as early as the first month of treatment and then persisted during follow-up.

Conclusions: Antihypertensive treatment with a fixed dose combination of ramipril and amlodipine significantly reduced office and ambulatory BP values in patients with AH, accompanied by a favorable effect on the elastic properties of arterial wall.

PP.36.12 COMBINED ANTIHYPERTENSIVE TREATMENT WITH RAMIPRIL AND AMLODIPINE POSITIVELY EFFECTS ARTERIAL STIFFNESS IN PATIENTS WITH COMPLICATED AND UNCOMPLICATED ARTERIAL HYPERTENSION

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Objective: Arterial hypertension (AH) affects a large proportion of the adult population and represents a leading risk factor for cardiovascular complications. AH complicated by symptomatic cardiovascular disease (CVD) represents a more advanced stage of disease and is more resistant to treatment. Our task was to evaluate the effect of fixed antihypertensive combination ramipril + amlodipine on blood pressure (BP) and arterial stiffness (AS) in patients with AH and history of stroke (complicate AH) and hypertensive patients without symptomatic CVD.

Design and method: We prospectively included 39 and 9 patients with uncomplicated and complicated AH, respectively. Follow-up was 2.7 months (1-7 months). We measured office and AS indices at baseline, 1st month and end of follow-up.

Results: Patients with complicated AH were older (67±11 vs 52±14 years, p=0.005), with higher body mass index (30.8±3.5 vs 27.9±3.3, p=0.02) and more often female (78 vs 28%, p=0.009). Baseline systolic BP (SBP) was significantly higher in complicated-AH-group (179±19 vs 157±18 mmHg, p=0.001), while diastolic BP (DBP) did not differ significantly between groups. We studied 5 AS indices, but only pulse-wave velocity (PWV) showed difference between the two groups, with higher values in stroke patients (9.1±2.2 vs 7.1±1.7 m/s, p=0.006).
At the end of follow-up BP decreased significantly in both groups (complicated AH: SBP 179±19 to 138±12, DBP: 108±11 to 85±8 mmHg, p<=0.001 for both; uncomplicated AH: SBP 157±18 to 128±12, DBP 105±10 to 83±7 mmHg, p<0.001 for both). All AS parameters were positively influenced during treatment in both groups. PWV decreased from 9.1±2.2 to 7.3±2.1 m/s, p=0.02 in patients with complicated AH and from 7.1±1.6 to 6.2±1.3 m/s, p<0.001 in those without symptomatic CVD. And although SBP was still significantly higher at the end of follow-up in complicated compared to uncomplicated-AH-group, PWV values between groups did not demonstrate a significant difference anymore.

Conclusions: Antihypertensive treatment with fixed dose combination of ramipril and amlodipine significantly reduced office BP and PWV in patients with both complicated and uncomplicated AH and smoothes the baseline (before treatment) difference in arterial rigidity (PWV) between these two groups.

PP.36.13 DIFFERENTIAL IMPACT OF BLOOD PRESSURE-LOWERING STRATEGIES ON CENTRAL SYSTOLIC BLOOD PRESSURE AND PULSE WAVE VELOCITY IN OBESE HYPERTENSIVES

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Objective: We investigated data of 93 obese patients with arterial hypertension I-III grade to determine the impact of different antihypertensive drug combination on central systolic pressure, aortic augmentation index and pulse wave velocity.

Design and method: All participants were randomized to 3 groups: 36 patients were assigned to combination of verapamil and trandolapril (180/2 mg daily), 28 - to bisoprolol 5-10 mg, 29 – to combination of perindopril and amlodipine (5/5, 5/10, 10/10 mg). All patients came through ambulatory blood pressure monitoring with central arterial pressure and pulse wave velocity analysis before and after 6 months of treatment period.

Results: Despite similar significant brachial blood pressure reduction, the impact of 3 antihypertensive strategies on central systolic blood pressure and pulse wave velocity was different. There was substantial reduction of central systolic pressure (Delta -16,2 mmHg; 95% CI -23.5 to -8.9; P<0,01) and aortic augmentation index (Delta -4,2%; 95% CI -7.5 to 2.8; P<0,05) with perindopril/amlodipine regimen. Despite similar decrease in heart rate, bisoprolol was less effective in reduction of central systolic blood pressure than verapamil/trandolapril combination (Delta -7,2 mmHg; 95% CI -18.3 to 5.6; P=0,4 versus Delta -10,8 mmHg; 95% CI -20.1 to 1.9; P=0,2) due to increase of augmentation index (Delta 2%; CI -9.9 to 13.9; P=0,6). Aortic pulse wave velocity was decreased by all drug regimens, but more substantially by verapamil/trandolapril combination (Delta -0,64 m/s; 95% CI -1.4 to 0.1; P<0,05). Perindopril/amlodipine regimen was less effective (Delta -0,2 m/s; 95% CI -0.6 to 0.3; P=0,4), probably related to increase of heart rate.

Conclusions: Assigned blood pressure-lowering strategies produce differential impact on central systolic pressure and aortic pulse wave velocity due to complex influence on peripheral vasodilation, aortic stiffness and heart rate.

PP.36.14 COMBINATION OF ANTIHYPERTENSIVE THERAPY IN THE ELDERLY, MULTICENTER INVESTIGATIONAL (CAMUI) TRIAL: THE SUB-ANALYSIS OF THE VISIT-TO-VISIT AND SEASONAL BLOOD PRESSURE VARIABILITY

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Objective: Combination therapy with angiotensin receptor blockers (ARBs) and calcium channel blockers (CCBs) or diuretics is common for hypertensive patients. The present sub-analysis aimed to investigate the blood pressure (BP) variability in ARB-based combination therapy.

Design and method: We conducted a prospective, randomized, open-label trial. Hypertensive outpatients aged >65 years who did not achieve the target blood pressure with usual dosages of ARBs were randomly assigned to switch treatment to 50mg losartan /12.5mg hydrochrothiazide (ARB+D; n=72) or 5mg amlodipine in addition to ARBs (ARB+C; n=68) for one year. The clinic BP and heart rate (HR) were taken at 3 month intervals. We evaluated the average systolic BP and diastolic BP (Ave SBP/ DBP), maximum SBP and DBP (Max SBP/DBP), minimum SBP and DBP (Min SBP/DBP), heart rate (HR), visit-to-visit variability and seasonal variation in the BP in both groups.

Results: There was no significant difference between the groups regarding the Ave SBP/DBP, Max SBP/DBP, Min SBP/DBP and HR (132.5/72.3±10.9/8.2 mmHg, 144.8/79.9±13.9/8.2 mmHg, 119.5/66.2±11.2/9.9 mmHg, 72.1±7.8 beats/min [ARB +D] vs. 132.5/71.4±10.3/7.4 mmHg, 142.7/77.4±12.4/8.5 mmHg, 121.9/65.0±10.1/7.0 mmHg, 70.6±7.7 beats/min [ARB+ C], respectively). The visit-to-visit variability assessed by the standard deviation (SD)-SBP/DBP was significantly higher in the ARB+D group than ARB+C group (ARB+D: 9.7±4.4, 7.3±3.2, ARB+C: 8.1±3.6, 6.1±2.6). When each group was divided into 2 groups according to the starting season of the protocol (summer [S] or winter [W]), there was no significant difference regarding the BP values between the summer and winter (S: ARB+D:137.0±76.3 mmHg, ARB+C: 134.0±71.4 mmHg, W: ARB+D:138.3±73.6 mmHg, ARB+C: 131.9±72.1 mmHg). In step multivariate regression analyses including the CV-SBP, the starting season, etc., the significant determinants of the UACR at 12 months in the ARB + D group was the starting season, whereas it was not a significant determinant in the ARB + C group.

Conclusions: In conclusion, in the combination therapy with ARBs, CCBs were advantageous for the blood pressure variability. As for the seasonal variability, both treatments can be used safely in all seasons in elderly hypertensive patients.

PP.36.15 EFFICACY OF COMBINATION OF THE DIRECT RENIN INHIBITOR ALISKIREN AND HYDROCHLOROTHIAZIDE IN HYPERTENSIVE PATIENTS

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Objective: To evaluate the effects of combination of aliskiren and hydrochlorothiazide (HCT) on components of the Renin-angiotensin-aldosterone system, plasma b type natriuretic peptide (BNP), insulin and cystatin C level in patients with hypertension I-II degree younger or older than 60 years.

Design and method: In the study were included 60 patients, average age 55.7±11.7years. After 2 weeks of therapy by aliskiren 300 mg/day patients were randomized to group 1 (aliskiren 300mg/day and HCT 12.5mg/day) and group 2 (aliskiren 300mg/day and HCT 25mg). Plasma renin activity (PRA),plasma aldosterone, insulin, BNP and cystatin C level were assessed at inclusion (baseline) and after 16 weeks of therapy.

Results: In both group baseline PRA were lower in men (0.42±0.08ng/ml/h) than women (1.1±0.31ng/m/h) baseline aldosterone plasma level were lower in women (76±9.2ng/ml) than men (102±6.6ng/ml). PRA were lower in patients older than 60 years old.
PRA, plasma aldosterone, BNP, insulin and cystatin C level significantly ($p< 0.01$) decreased after 16 weeks of treatment in both group (PRA decreased from 1.05±0.29ng/ml/h to 0.02±0.01ng/ml/h; aldosterone decreased from 86.9±69.4ng/ml; insulin decreased from 10.23±1.1 to 8.55±1.05; BNP decreased from 101.83±11.1ng/ml to 62.36±21.1ng/ml; cystatin C decreased from 1050.32±110mg/l to 703.24±89.9mg/l). There were no significant different in BNP, insulin, cystatin C baseline level between groups.
After 16 weeks of therapy systolic blood pressure and diastolic blood pressure level decreased significantly ($p< 0.01$) in group 1 from 152.6±8.2 mmHg to 131±8.0 mmHg, from 89±13 mmHg to 78±6 mmHg; in group 2 from 155.9±9.2 mmHg to 128±9 mmHg, from 90.5±12 to 74±8 mmHg. Target blood pressure (BP) level was achieved in 60% and in 70 % of cases respectively.

Conclusions: Combination of aliskiren and HCT in doses 12,5mg/day and 25 mg/day decrease.
PRA, plasma aldosterone, insulin, BNP and cystatin C level in all groups. There was no statistical difference in the magnitude of BP reduction in men and women or in patients younger or older than 60 years. Combination of aliskiren and HCT in doses 12,5mg/day and 25 mg/day provides significant decrease of BP level and achievement of target BP values in 60 % and 70% respectively.

PP.36.16 DOES THE NUMBER OF DRUGS MATTER? POTENTIAL ROLE OF SINGLE-PILL FIXED-DOSE COMBINATION TO REDUCE NONPERSISTENCE OF ANTIHYPERTENSIVE MEDICATION

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Objective: Persistence in taking prescribed medication is related to the number of drugs, according to several studies. A single-pill fixed-dose combination (FDC) may improve persistence over a regimen with multiple agents. The objective of this study was to compare nonpersistence between a regimen of multiple antihypertensive drugs (AHD) and one with a FDC tablet in a real-world setting.

Design and method: Nonpersistence (defined as not remaining on treatment) was studied using the same protocol in three separate 12-week post-marketing surveys of patients prescribed the angiotensin receptor blocker olmesartan (OLM; n=1823), calcium channel blocker azelnidipine (AZ; n=1055), or an FDC of OLM plus AZ (n=1353). To avoid bias, we included patients prescribed a CCB plus a renin-angiotensin system inhibitor at baseline. We excluded patients who were naïve to antihypertensive treatment or simply switched from OLM plus AZ to FDC. The rate of nonpersistence, number of AHD and achieved blood pressure (BP) levels at 12 weeks were compared. We also investigated factors related to nonpersistence to AHD.

Results: The mean age in the OLM, AZ, and FDC groups respectively was 67.8±12.0, 67.2±12.0, and 69.2±12.3 years old, and the proportion of women was 51.7%, 54.4%, and 50.4%. The BP level at baseline was 161/87, 161/88, and 150/83 mmHg as arithmetic mean, and at 12 weeks was 140/78, 143/79, and 138/77 mmHg as least squares mean adjusted by age, sex, and baseline BP ($p<0.0001$). The cumulative proportion of nonpersistence during the 12-week treatment period was 10.5%, 10.8%, and 6.7% ($p=0.0002$), and the number (SD) of AHD per patient was 2.44(0.77), 2.36(0.64), and 1.35(0.72) ($p<0.0001$). The rate of nonpersistence was higher in patients taking >=3 AHD daily compared with those taking <=2 AHD (12.5% vs 8.4%: $p=0.0001$). The rate of nonpersistence was not related to age<65 years, the presence of dyslipidemia and/or diabetes. Nonpersistence was higher among patients with a known duration of hypertension <5 year.

Conclusions: A FDC of OLM plus AZ was associated with lower rates of nonpersistence compared with a multi-tablet regimen of OLM or AZ, whether the FDC was add-on or replacement treatment of hypertension.

PP.36.17 STUDY NILO. EFFECTIVENESS OF NIFEDIPINE PROGRAMMED RELEASE CAPSULES IN MICRO-GRANULES AND LOSARTAN ALONE OR COMBINED IN THE TREATMENT OF ESSENTIAL HYPERTENSION

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Objective: To determine goal attainment rates with oral administration of nifedipine programmed release micro-granules 30 mg and Losartan 50 mg alone or combined, on the treatment of essential hypertension.

Design and method: A prospective, open-label, controlled, comparative study was conducted in Hypertension Unit of People's Clinic 'Nueva Esparta', La Asunción, Nueva Esparta, Venezuela. Patients of both genders aged between 30 and 85 years old and DBP> 95 or <110 and / or SBP> 150 or <200 without antihypertensive treatment were recruited. Nifedipine programed release micro-granules 30 mg OD or Losartan potassium 50 mg OD for 8 weeks were

administrated. Those patients whom didn't achieve targets less than or equal to 140 mmHg SBP and DBP less than or equal to 90 mmHg at 8 weeks received the association for an additional 8 weeks. Pressures were evaluated by sphygmomanometer Hg at baseline, 8 weeks, and if no pressure goals were achieved, at 16 weeks. At the beginning and end of study, routine laboratory and ambulatory blood pressure monitoring was performed during 24 hours.

Table 1. Mean blood pressures at baseline and treatment groups as measured by ambulatory blood pressure monitoring

	Baseline			Treatment period			
	Mean24h	Mean day	Mean night	Mean24h	Mean day	Meas night	P inter*
SBP Losartan	117.79 ± 36.23	122.33 ± 8.73	107.86 ± 12.43	110.63 ± 33.93	114.95 ± 6.48	103.38 ± 8.73	
P intra				0.001	0.001	0.057	
DBP	73.26 ± 23.52	77.10 ± 7.63	66.24 ± 10.40	68.47 ± 16.65	71.33 ± 6.27	64.10 ± 8.33	
P intra				0.001	0.001	0.21	
SBP Nifedipine	117.35 ± 25.01	123.54 ± 9.04	109.42 ± 11.48	109.25 ± 7.36	108.08 ± 21.72	105.38 ± 9.97	0.53
P intra				0.001	0.005	0.13	
DBP	74.14 ± 21.86	77.52 ± 17.04	69.18 ± 21.08	68.35 ± 14.85	70.35 ± 15.24	65.61 ± 14.82	0.77
P intra				0.001	0.001	0.02	

* It compares results of mean systolic and diastolic pressures of treated groups

Table 2. Achieving blood pressure goals by treatment group

Goal ≤140/90	Nifedipine N°47	Losartan N° 60	P
Control 8 weeks	27 (57.4%)	38 (63.3%)	0.70
Control 16 weeks (Combination)	10 (21.2%)	10 (16.6%)	1
Total control	37 (78.7%)	48 (80%)	0.94
No control	10 (21.2%)	12 (20%)	
They did not return to week 16*	2 (15.2%)	4 (6.6%)	

*Included in "no control"

Results: 181 patients were entered of whom 107 were analyzed by ITT. At baseline populations were similar in age, weight, height, BMI, waist-hip circumference and blood pressure baseline. Over half of patients achieved goals blood pressure with monotherapy and this rose to 80% with the use of the combination. There were not significant differences between the percentages of goal attainment between products administered in monotherapy, except with nocturnal mean blood pressure in nifedipine group which decreased more significantly than the losartan group.

Conclusions: Both products, individually or combined, were effective and safe to achieve blood pressure goals. Only it was reached statistical significance in nocturnal mean with nifedipine administration suggesting longer duration of action of this formulation.

PP.36.18 MOXONIDINE-BASED TREATMENT IMPROVES LEFT VENTRICULAR FUNCTION IN MODERATE HYPERTENSION

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Objective: To assess the dose-dependent impact of moxonidine-based combine antihypertensive treatment on left ventricular status in moderate arterial hypertension (HTN).

Design and method: 31 women at the age of 38-65 (49,4 ± 6,9 yrs old) with moderate HTN without additional risk factors were investigated. Study population was divided on 2 groups of different moxonidine dosage regimen: 0,2 mg daily (group 1, n = 18) and 0,4 mg daily (group 2, n 13). All significant ultrasound heart indexes: posterior wall thickness (PWT), interventricular septum thickness, end-systolic (ESD), end-diastolic dimensions (EDD), end-diastolic (EDV) and end-systolic volume (ESV), left ventricular (LV) mass index and ejection fraction (EF), E/A ratio, were measured and estimated (LOGIC P5 PRO, USA) at baseline and after 12-month of treatment. Statistical methods include t-test for dependent samples, statistically significant at p value < 0.05.

Results: Diastolic LV function improved in both groups after 12 month of treatment non dependent from baseline characteristics of diastolic function. E/A ratio was significantly increased (p = 0,005) as well as VTI and DT were reduced (p = 0,04). Diastolic function improvement was associated with left ventricular hypertrophy reduction at 14% in group 2 (p = 0,01), mainly due to PWT (p = 0,03). EDD and ESV were also significantly reduced and LV EF was moderately increased (p = 0,03) after 12 month of treatment.

Conclusions: Combined antihypertensive moxonidine-based 12-month treatment improves diastolic left ventricular function as well as regress left ventricular hypertrophy in female hypertensive patients.

PP.36.19 FIXED DOSE COMBINATION VALSARTAN + HYDROCHLOROTHIAZIDE VS BISOPROLOL + HYDROCHLOROTHIAZIDE INFLUENCE ON ARTERIAL BLOOD PRESSURE, ARTERIAL STIFFNESS AND SEXUAL DYSFUNCTION

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Objective: We compared the influence of fixed dose combination valsartan1 60mg+hydrochlorothiazide (HCTZ) 25mg (n=33) and bisoprolol10mg+HCTZ 25mg(n=27) on office, 24-hour and central blood pressure (BP); arterial stiffness and man sexual function.

Design and method: There were included 60 patients with mean systolic BP (SBP)/diastolicBP(DBP)-167,3+/-0,8/90,3+/-0,9mmHg. Baseline and during treatment there were done body mass, height, office BP and heart rate measurements, ambulatory blood pressure monitoring, pulse wave velocity (PWV) measurement, central SBP and pulse BP measurements, biochemical blood analysis, ECG. In men the sexual dysfunction was evaluated by international index of erectile function multidimensional scale. Patients were randomized on combinations and if target BP was not achieved at 1 month the amlodipine (up-titrated to 10mg) and after 3 month doxasosine were added. Follow-up period was 6 months.

Results: Both combination therapies were effective in office BP lowering (target BP-100 and 96,3% in valsartan and bisoprolol groups respectively, NS), but in bisoprolol group there were used higher doses of amlodipine (59,3vs27,3%) and more frequently doxazozine (11,1vs0%) than in valsartan group. There were not noted any big differences in decreasing of 24-h BP between groups, but night pulse BP and day-time variability of DBP lowered only in valsartan group. Both drug strategies were effective in diminishing of central SBP (lowering- -11,4+/-1,1vs-14,1+/-1,3mmHg on valsartan and bisoprolol respectively,NS), central SBP normalization rate was higher on valsartan (90,6%vs63%,P<0,02). Central pulse BP decreased significantly only in valsartan group (from 49,1+/-3,5 to 35,5+/-2,8mmHg,P<0,01). In spite of significant decreasing of central SBP, we noted significant increasing of augmentation index on bisoprolol from 32,2+/-1,3till36,7+/-1,3 %(P<0,05), which was explained by heart rate diminishing. On valsartan augmentation index did not change significantly (27,2+/-5,2to19,4+/-1,98%). Significant decreasing of PWV we found only on valsartan. Both combination treatments were metabolic neutral and safe, but adverse reaction rate was higher for bisoprolol 44,4vs18,2%,P<0,05. Valsartan base therapy improved erectile function and total satisfaction in 23,8% men, while bisoprolol base therapy did not change any sexual function parameters.

Conclusions: Therapy based on valsartan+HCTZ combination might be more preferable, than on bisoprolol+HCTZ combination, especial in patients with higher arterial stiffness and in men with sexual dysfunction.

PP.36.20 COMPARATIVE EFFICACY OF NEBILONG AM IN THE TREATMENT OF PATIENTS WITH MODERATE TO HIGH HYPERTENSION

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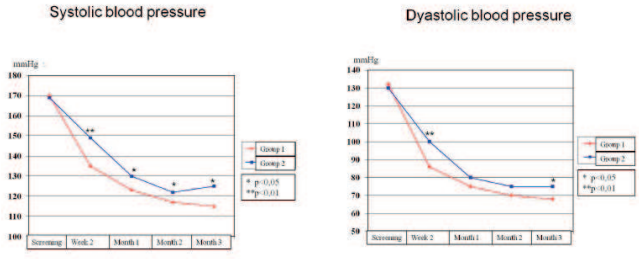
Objective: To evaluate the efficacy of a fixed-dose combination of nebivolol and amlodipine (Nebilong AM) in patients with moderate to high hypertension.

Design and method: 124 consecutively admitted patients with primary hypertension were included in the study. All patients were randomly divided (simple random sampling) into 2 groups with equal number of patients in each. Group 1 (n = 62) received a fixed-dose combination of amlodipine and nebivolol (Nebilong

AM), whereas Group 2 (n = 62) received a free-dose combination of nebivolol and amlodipine. Follow-up period of patients was 3 months with the following frequency of visits: in the first 2 weeks and after 1, 2 and 3 months after they have been included in the study.



Results: A comparative analysis of 2 groups have reported significantly lower values of both systolic and diastolic blood pressure in patients (starting from the visit Week 2) taking a fixed-dose combination of amlodipine and nebivolol (NebilongAM). 60 % in Group 1 and 52 % of patients in Group have reached the target blood pressure in two weeks of combined dual therapy in patients. By the end of the 1st month of follow-up the target blood pressure has been achieved in 86 % of patients in Group, compared to 71% of patients in Group 2. In cases where patients have not reached the target blood pressure by the end of the 1st month during the follow-up and have been receiving 2.5 mg of amlodipine and 2.5 mg of nebivolol - in both free- and fixed-dose combinations, the titration to 5.0 mg was performed. By the end of the 2nd month of the follow-up 93 % of patients in Group 1 and 78 % of patients in Group 2 have reached the target blood pressure. After 3 months of follow-up almost all patients have achieved the target BP.

Conclusions: Combined therapy of a fixed-dose combination of amlodipine and nebivolol (NebilongAM) appears to be one of effective approaches in the treatment of patients with moderate to high hypertension.

PP.36.21 EFFICACY OF ZOFENOPRIL OR IRBESARTAN BOTH COMBINED WITH HYDROCHLOROTHIAZIDE IN ELDERLY SUBJECTS WITH ISOLATED SYSTOLIC HYPERTENSION UNTREATED OR UNCONTROLLED BY MONOTHERAPY

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Objective: To compare the antihypertensive efficacy of zofenopril (Z) + hydrochlorothiazide (H) vs. irbesartan (I) + H on day-time systolic blood pressure (SBP) in elderly subjects with isolated systolic hypertension (ISH), untreated or uncontrolled by a previous monotherapy.

Design and method: After a 1-week run-in, 230 subjects (>65 years) with ISH (office sitting SBP >=140 mmHg and diastolic, DBP <90 mmHg + day-time SBP >=130 mmHg and day-time DBP <90 mmHg), untreated or on monotherapy, were randomized to 18-week double-blind treatment with Z 30 mg + H 12.5 mg or I 150 mg + H 12.5 mg once-daily, in an International, multicenter study. After 6 and 12-weeks, Z and I doses could be doubled in non-normalized subjects. After 12-weeks, in non-responders under full drug dose, nitrendipine 20 mg was added. The primary study endpoint was the average day-time SBP reduction after the first 6-weeks of treatment.

Results: In the intention-to-treat population (n=216) baseline-adjusted average day-time SBP reductions after 6-weeks of treatment were similar (p=0.969) with Z+H (8.3±11.3 mmHg, n=109) and I+H (8.3±11.1 mmHg, n=107). The day-time SBP reduction was well maintained during the study, with a trend favorable to Z+H at study end, particularly in those subjects maintained under the low drug dose (Z+H: 16.2 mmHg vs. I+H: 11.2 mmHg, p=0.028). The proportion of subjects achieving day-time normalization (SBP <135 mmHg) or adequate response (normalization or reduction >=10 mmHg) was similar under Z+H and I+H at 6 and 12-weeks, while it was significantly larger under Z+H at 18-weeks (normalized: 68 vs. 56%, p=0.031; responders: 73 vs. 63%, p=0.049), particularly in the low dose subgroup (89 vs. 73%, p=0.017 and 92 vs. 78%, p=0.024). Both treatments were well tolerated with a similarly low discontinuation rate due to an adverse drug reaction (Z+H: 7% vs. I+H: 8%).

Conclusions: Elderly subjects with ISH previously untreated or uncontrolled by a monotherapy well respond to a combination of Z+H or I+H. However, the Z+H antihypertensive efficacy resulted superior to that of I+H at the low drug dose.

PP.36.22 COMPARISON BETWEEN BISOPROLOL AND RAMIPRIL IN PATIENTS WITH ARTERIAL HYPERTENSION AND LEFT VENTRICULAR HYPERTROPHY

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Objective: The aim of study was comparison of the effects of bisoprolol and ramipril, as well as their combination, on left ventricular hypertrophy(LVH) in hypertensive patients.

Design and method: 103 patients with AH II and III degree with moderate course of diabetes mellitus type 2 and left ventricular mass index (LVMI) > 110g/m2 in women and 125 mg/m² - in men without heart failure were randomized to 3 group: patients of I group (n=36) received ramipril at 5 mg daily dose; patients of II group(n=37) – bisoprolol at 5 mg daily dose and patients of III group (n=30) - ramipril and bisoprolol at 5 mg daily dose.End diastolic diameter (EDD) of left ventricle, LVMI, the thickness of interventricular septum (IVST) and posterior wall thickness (PWT) in diastole were determined by Echocardiography at baseline and after 12 months of treatment.

Results: All patients reached the target blood pressure < 125/75 mm Hg. At the end of study regression of LVH was achieved in 15 (41.7%) patients I group, in 16(43.2%) patients of II group and in 22 (73.3%) patients III group. Reducing of LVMI by 13.3%, 13.7% and 21.9% accordingly in groups ($p<0.05$) accompanied by reliably positive changes in other echocardiographic indices of remodeling of heart: the EDD has decreased from 5.68±0.11sm to 5.20±0.13 cm ($p<0.05$) – in I groups; 5.77±0.12 cm to 5.34±0.15sm ($p<0.05$) – in II groups and 5.78±0.11sm to 5.31±0.11sm($p<0.05$) – in III groups. IVST has decreased from 1.38±0.05 cm up to 1.18±0.09cm ($p<0.05$) - in I groups; 1.40±0.11sm up to 1.19±0.12 cm ($p<0.05$) – in II groups; 1.40±0.09 cm up to 1.15±0.10 cm ($p<0.05$) - in III groups. PWT has decreased from 1.27±0.07 cm to 1.15±0.06 cm ($p<0.05$) – in I groups; from 1.29±0.06 cm to 1.16±0.05 cm ($p<0.05$) – in II groups and from 1.30±0.05 cm to 1.13±0.07 cm ($p<0.05$) – in III groups.

Conclusions: The hypotensive effect of ramipril and bisoprolol separately and in combination with each other in patients with severe AH and diabetes mellitus type 2 is accompanied with regression of LVH and remodeling of heart.

PP.36.23 COMPARATIVE EVALUATION OF THE IMPACT OF COMBINATION OF DIFFERENT MEDICATIONS IN ANTIHYPERTENSIVE THERAPY

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Objective: The aim of present study was investigation of influence of combination of ACE-inhibitors (Zofenopril) with Ca-antagonist`s (Lercanidipine) and ACE-inhibitors (Zofenopril) with diuretic (Hydrochlorothiazide) on heart functions and dynamics of myocardial remodeling in patients with arterial hypertension (AH).

Design and method: Fifty-six patients (average age 61.4±2.0 y.) with mild to moderate AH and without signs of heart failure were observed. Doppler-echocardiography and echocardiography were performed to all of them at baseline and after 6 month of treatment. Inter-ventricular septum thickness (IVST), left ventricle (LV) post wall thickness (PWT) in diastole, LV ejection fraction (EF), velocity of shortness of myocardial circular fibers (Vcf), velocity of shortness of LV anterior-posterior size in systole (ΔS), LV mass index (LVMI), early diastolic mitral flow velocity / atrial induced velocity ratio (E/A ratio), isovolumetric relaxation time (IVRT) and blood flow deceleration time (DT) were defined. Patients were randomized into 2 groups of 28 patients in each. Patients in I group received Zofenopril in 30 mg and Lercanidipine in 10 mg daily dose; patients in II group – Zofenopril in 10 mg Hydrochlorothiazide in 12.5 mg daily dose.

Results: All patients achieved goal blood pressure level – 140/90 mm Hg.LVMI decreased by 21.4% in I and 10.7% in II ($p<0.05$), IVST – by 10.1% in I and 7.1% in II ($p<0.05$), PWT – by 10.7% in I and 6.9% in II groups ($p<0.05$) respectively. Increase of EF by 17.9% in I and 8.9% in II ($p<0.05$), Vcf – by 12.5% in I and 10.1% in II ($p<0.05$) and ΔS by 18.7% in I and 12.4% in II groups ($p<0.05$) respectively was observed. Initially infringed diastolic function was improved: E/A increased by 24.1% in I and 12.8% in II ($p<0.05$), IVRT decreased by 21.7% in I and 13.1% in II ($p<0.05$), DT – by 15.6% in I and 9.3% in II groups ($p<0.05$).

Conclusions: Hypotensive long-term therapy with combinations Zofenopril +

Lercanidipine and Zofenopril + Hydrochlorothiazide has the same antihypertensive effect, promotes regression of LV hypertrophy and LV remodeling, but the combination of Zofenopril +Lercanidipine is more preferable.

PP.36.24 A MULTICENTER, NON COMPARATIVE STUDY TO EVALUATE THE EFFICACY OF SEVIKAR® (OLMESARTAN MEDOXOMIL COMBINED WITH AMLODIPINE) ON OFFICE BLOOD PRESSURE, PULSE WAVE VELOCITY AND CENTRAL BLOOD PRESSURE

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Objective: This study was to investigate whether the single pill combination (SPC) of Olmersartan medoxomil (OLM) 20 mg and Amlodipine besylate (AMLO) 5 mg improves blood pressure reduction, brachial-ankle pulse wave velocity (baPWV) and central blood pressure (CBP) in hypertensive patients who had failed to resopond to treatment with 4 weeks of AMLO 5 mg monotherapy.

Design and method: A prospective, open, multicenter, non-comparative study. Patients with hypertension were titrated to the AMLO 5 mg for 4 weeks. If blood pressure was not controlled, they were switched to the SPC (OLM 20 mg/AMLO 5 mg) for 8 weeks. Definitions of uncontrolled BP were more than 140 mmHg of seated systolic BP (SeSBP) and more than 130 mmHg of SeSBP in diabetes. Uncontrolled 47 patients were included in this study. Primary effectiveness endpoint was reduction of SeSBP and secondary effectiveness endpoint was attaining rate of target SBP at 8th week. ald also baPWV using automated device (VP-1000, Colin, Co. Ltd. Komaki, Japan) and CBP using SphygmorCor® device (AtCor Medical, Sydney, Australia) were done at baseline and after 8 weeks of treatment.

Results: SPC (OLM 20 mg/AMLO 5mg) for 8 weeks reduced SeSBP/Seated Diastolic blood pressure by up to 22 mmHg and 14 mmHg, respectively. 74.5% of patients on SPC (AMLO 5 mg and OLM 20 mg) therapy achieved their SBP goal by week 8. SPC (OLM 20 mg/AMLO 5mg) for 8 weeks also reduced baPWV and CBP include AIX@75 significantly.

	Base line	After 8 weeks	
SeSBP (mmHg)	153±9	131±18	P=0.001
SeDBP (mmHg)	95±8	80±11	P=0.001
baPWV (cm/sec)	1,494±262	1279±140	P<0.001
SBP on SphygmoCor® (mmHg)	144±13	120±13	P<0.001
DBP on SphygmoCor® (mmHg)	98±7	83±10	P<0.001
AIx@75 on SphygmoCor® (%)	27±9	21±10	P<0.001

Conclusions: These results suggest that SPC (OLM 20 mg/AMLO 5mg) for 8 weeks is effective in reducing BP, baPWV and CBP include AIx@75 in uncontrolled hypertensive patients with AMLO 5 mg monotherapy.

PP.36.25 EFFECTIVENESS OF BETA-BLOCKERS AND ACE INHIBITORS IN PATIENTS WITH NONOBSTRUCTIVE HYPERTROPHIC CARDIOMYOPATHY AND ARTERIAL HYPERTENSION

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Objective: There are few studies focused on arterial hypertension (AH) treatment in patients with hypertrophic cardiomyopathy (HCM).
Purpose: to assess the effect of beta-blockers (BB) and ACE inhibitors on blood pressure (BP) profile in patients with HCM and AH.

Design and method: We examined 9 patients with nonobstructive HCM and 2-3 AH degree (7 women (77.8%), average age 53.4±12.8 years) using 24-h BP monitoring («BPLab») with arterial stiffness and central BP assessment before and after 1 month of BB bisoprolol administration (dose 6.1±2.5 mg). To achieve a target BP level ACE inhibitor perindopril (dose 4.3±1.2 mg) was added with assessment of it effectiveness after 6 month of combined therapy.

Results: After 1 month of bisoprolol treatment 24-h BP monitoring showed significant decrease of maximum systolic BP (SBP) (from 169.7±12.2 to 149.1±19.8 mmHg, p=0.03), minimum SBP (from 102.9±12.1 to 94.6±14.8 mmHg, p=0.05), average daytime diastolic BP (DBP) (from 78.4±10.7 to 68.9±11.5 mmHg, p=0.03), daytime SBP time index (from 37.2±24.9 to 27.8±25.6%, p=0.02), average nighttime DBP (from 72.8±14.2 to 65.2±17.8 mmHg, p=0.01), nighttime SBP time index (from 36.4±40.9 to 17.7±31.9%, p=0.03), nighttime DBP time index (from 11.1±12.9 to 7.3±10.7%, p=0.02), morning SBP and DBP elevation value (p=0.02, p=0.007), morning DBP elevation velocity (from 25.0±11.4 to 19.3±13.3 mmHg/h, p=0,02). Dippers increased from 22.2 to 44.4%, p>0.5. Parameters of arterial stiffness were decreased: dPdT from 707.6±130.1 to 613.0±161.3 mmHg/s, p=0.007), arterial stiffness index (ASI) from 154.4±23.3 to 140.2±24.6 mmHg, p=0.002). Decreases of central BP parameters in aorta were revealed: SBPao from 127.6±17.4 to 111.0±15.7 mmHg, p=0.01, average BPao from 94.4±13.8 to 84.4±16.7 mmHg, p=0.04. After 6 month of combined therapy with perindopril daytime SBP time index decreased to 22,9±25,7% (p=0.01), average pulse BP decreased from 54.8±7.7 to 43.2±8.2 mmHg, p=0.02). The «night-pickers» disappeared (from 11.1 to 0%). ASI decreased from 140.2±24.6 to 124.9±16.8 mmHg, p=0.04).

Conclusions: Therapy with bisoprolol in patients with HCM and AH followed by significant decrease of 24-h BP monitoring parameters, parameters of arterial stiffness and central BP. Combined therapy with perindopril followed by average pulse BP decrease, additional decrease of daytime SBP time index and ASI.

PP.36.26 MYOCARDIAL STRESS AND BRONCHIAL TREE STATUS IN PATIENTS WITH BRONCHIAL OBSTRUCTION AND ARTERIAL HYPERTENSION AND HEART FAILURE DURING THERAPY WITH PERINDOPRIL AND AMLODIPINE

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Objective: To evaluate the dynamics of both myocardial stress and bronchial tree status in patients with chronic obstructive pulmonary disease (COPD) accompanied with arterial hypertension (AH) and coronary artery disease (CAD) complicated with heart failure (CHF) during standard therapy including fixed combination of perindopril and amlodipine.

Design and method: 60 patients with AH and CAD complicated with CHF, and accompanied with COPD were randomized into 2 equal groups for different antihypertensive treatment. Patients in the 1st group received fixed combination of perindopril and amlodipine (the dose titrated depending on baseline blood pressure). Patients in the 2nd group received enalapril or non-fixed combination of enelapril and amlodipine. Duration of therapy consisted of 6 months. Average age was 55,28±7,81 years. Average functional class of CHF was 2,64±0,48. Before and after treatment there were evaluated the following parameters: NT-proBNP for evaluation of myocardial stress severety and TIMP-I to evaluate collagen matrix status. To examine the bronchial tree spirometry and plasma level of surfactant,pulmonary-associated protein A (SFTPA) were used. Average forced expiratory volume (FEV-1) was 64,2+13,1%.

Results: There was no significant difference between the groups in target-BP achievement. Dynamics of NT-proBNP was significantly lower in 2nd group -26,4[-74,55;-3,15]% vs -72,2[-84,55;-36,15]% (p=0,033). TIMP-I decreased significantly more in 1st group during treatment: -63,9[-76,6;-38,9]% vs -14,55[-49,6;107,0]% (p=0,022). FEV-1 increased significantly more in 1st group and decreased non-significantly in 2nd group: 9,7[0,5;15,5],% and -1,35[-0,05;-0,057],%, respectively (p=0,046). SFTPA significantly increased in 1st group and did not cange in 2nd group: 10,3[0,8;18,5]%, and – 0,8[-0,9;3,8], respectively (p=0,002).

Conclusions: Fixed combination of perindopril and amlodipine in patients with AH and CAD complicated with CHF, and accompanied with COPD, provides more evident suppression of myocardial stress and improves bronchial tree status compared with free combinations of enalapril and amlodipine through significant positive influence on collagen formation in tissues in equal antihypertensive effect.

PP.36.27 NIFEDIPINE GITS/CANDESARTAN COMBINATION ASSOCIATED WITH EARLIER, GREATER BP CONTROL RATES (ESH/ESC 2013 TARGET) THAN RESPECTIVE MONOTHERAPIES IN PATIENTS WITH AND WITHOUT DIABETES

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Objective: This sub-analysis of the DISTINCT (reDefining Intervention with Studies Testing Innovative Nifedipine GITS – Candesartan Therapy) study re-

examined blood pressure (BP) control rates in participants with diabetes treated with nifedipine GITS and/or candesartan cilexetil using the new European Society of Hypertension (ESH)/European Society of Cardiology (ESC) (2013) BP target.

Design and method: DISTINCT was an 8-week, randomised, double-blind, multifactorial study in which individuals with hypertension (diastolic blood pressure [DBP] >=95–<110 mmHg) were treated with nifedipine GITS (N20, 30, 60 mg) and/or candesartan cilexetil (C4, 8, 16, 32 mg) or placebo. BP control rates in participants with and without diabetes at Week 8 were analysed using the updated ESH/ESC (2013) target for diabetes patients of BP<140/85 mmHg.

Results: Overall, 1381 individuals were randomised in DISTINCT, including 205 participants with type 2 diabetes mellitus (baseline systolic blood pressure [SBP]/DBP: 159/99 mmHg; mean age: 57 years); the full efficacy analysis set included 1362 individuals, 202 of whom had type 2 diabetes mellitus. Higher BP control rates were achieved with combination therapy compared with respective monotherapies and placebo (Table). The greatest 8-week control rate in participants with diabetes (66.7%) was observed in the N30C32 group, and not the highest dose group (N60C32).

	Week 2		Week 8	
Participants (%) achieving BP <140/85 mmHg	No diabetes (n=1160)	Type 2 diabetes mellitus (n=202)	No diabetes (n=1160)	Type 2 diabetes mellitus (n=202)
Placebo	4.1	15.4	6.8	15.4
C8	25.7	23.1	24.3	30.8
C16	19.7	23.1	26.8	15.4
C32	36.5	0.0	31.1	30.0
N30	14.9	18.8	20.9	18.8
N60	23.4	37.5	31.3	31.3
N30C8	38.5	37.5	41.0	37.5
N30C16	38.7	38.5	41.3	38.5
N30C32	50.0	66.7	47.4	66.7
N60C16	48.5	43.8	48.5	43.8
N60C32	42.5	45.5	52.1	54.5

Conclusions: Nifedipine GITS/candesartan cilexetil combinations were associated with earlier and greater BP control rates than respective monotherapies in participants with type 2 diabetes mellitus; the most optimal combination dosage was found to be 30 and 32 mg, respectively. These findings indicate that combination treatment with nifedipine GITS and candesartan cilexetil will fulfil the ESH/ESC (2013) recommendations for BP control in a majority of patients with hypertension and diabetes.

PP.36.28 NIFEDIPINE GITS/CANDESARTAN COMBINATION PROVIDES EFFECTIVE BP LOWERING ACROSS ALL SBP AND DBP CATEGORIES

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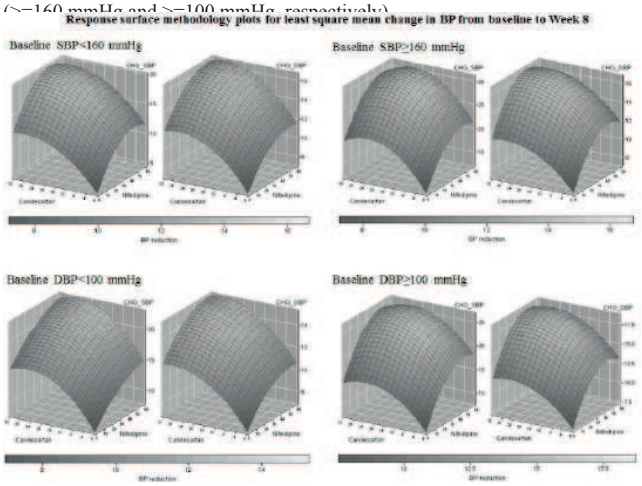
Objective: To investigate the relationship between baseline systolic blood pressure (SBP) and diastolic blood pressure (DBP) categories and the antihypertensive efficacy of nifedipine GITS/candesartan cilexetil combination, or the respective component monotherapies, in hypertensive participants enrolled in the DISTINCT (reDefining Intervention with Studies Testing Innovative Nifedipine GITS – Candesartan Therapy) study.

Design and method: Multicentre, double-blind, multifactorial study in which hypertensive participants aged >18 years with DBP >=95–<110 mmHg were randomized to placebo, or varying doses of monotherapy or combination therapy with nifedipine GITS (N; 20, 30 or 60 mg) and candesartan cilexetil (C; 4, 8, 16 or 32 mg) daily for 8 weeks. A descriptive subgroup analysis (ANCOVA) was performed to analyse BP reduction in participants with baseline SBP <160 mmHg or >=160 mmHg, and those with DBP <100 mmHg or >=100 mmHg.

Results: Overall, 1362 patients were included in the subgroup analysis. In all participants, NC combinations provided greater SBP and DBP lowering compared with the respective component monotherapies or placebo (Figure), with the greatest BP reductions achieved in the more severe SBP and DBP subgroups



In each of the SBP and DBP subgroups, treatment-related vasodilatory events (flushing, headache or oedema) were reported less frequently for patients receiving NC combination therapy than those on N monotherapy (SBP<160 mmHg, 17.1% and 21.3%; SBP>=160 mmHg, 20.5% and 26.9%; DBP<100 mmHg, 18.5% and 25.5%; DBP>=100 mmHg, 18.1% and 21.0%, respectively).

Conclusions: Nifedipine GITS and candesartan combination provided greater BP reductions over 8 weeks than the respective component monotherapies, and were equally effective in moderate (SBP >=160 mmHg or DBP >=100 mmHg) as in mild hypertensive participants. Furthermore, rates of vasodilatory events were lower for nifedipine GITS and candesartan combinations than nifedipine GITS monotherapy. These data support the use of calcium antagonist and angiotensin receptor blocker combination therapy in patients with both mild and moderate hypertension, in whom BP normalisation with high drug tolerability would greatly reduce the risk of cardiovascular events.

PP.36.29 COMPARATIVE STUDY OF CLINICAL EFFICACY TWO COMBINATIONS OF INDAPAMIDE WITH LERCANIDIPINE AND VALSARTAN IN HYPERTENSIVE PATIENTS

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Objective: To evaluate antihypertensive and organ-protective efficacy of two combinations of indapamide with lercanidipine and valsartan in hypertensive patients.

Design and method: 44 patients with stage I-III arterial hypertension (ESC/ESH 2007) were included to study. Mean age of the patients was 48.32±9.67 years. Blood pressure (BP) was measured by Korotkov method. Left ventricular hypertrophy (LVH) was assessed by M-mode echocardiography. Endothelium dependent vasodilatation (EDVD) of the brachial artery was evaluated using reactive hyperemia test. 21 patients (1st group) took indapamide (Indap, "PRO.MED.CS") in daily dose 2.5 mg and lercanidipine (Lercamen, "Berlin-Chemi Menarini Group") in average dose 16.85±4.67 mg; 23 patients (2nd group) took indapamide with valsartan (Nartivan, "Gedeon Richter") in average dose 80.0±40.86 mg. Both of groups were treated during 12 weeks. Results were expressed as mean±SD.

Results: By the end of the 12-weekly therapy was observed significantly reduce of blood pressure in both groups, with statistically reliable in degree of reduction on DBP and mean BP between two groups: DBP on 23.64±5.41% (1st group) and 19±5.4% (2nd one), p=0.016, and mean BP on 23.53±4.43% (1st group) and 19.4±5.77% (2nd one), p=0.016. 1st group patients achieved goal SBP and DBP in 100%, 2nd group patients – in 88% cases respectively. LVH were significantly reduced in both combination groups on 12.73±7.92% (p=0.006) and 13.8±8.55% (p=0.029) for 1st and 2nd groups respectively. EDVD also were significantly improved and normalization in both therapy groups (p=0.01 and p=0.002 for 1st and 2nd groups respectively). Tolerability of two drug combination therapy was good.

Conclusions: Comparative study of clinical efficacy two combinations of indapamide with lercanidipine and valsartan in hypertensive patients have shown high antihypertensive and organ-protective efficacy with good clinical tolerability.

PP.36.30 EFFICIENCY OF COMBINED PERINDOPRIL, AMLODIPINE AND TRIMETAZIDIN IN TREATMENT PATIENTS WITH HEART FAILURE AND HYPERTENSION

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Objective: The purpose of this study is to investigate the action of perindopril, combined action of perindopril and amlodipine in combination with trimetazidine on patients with heart failure and hypertension.

Design and method: We observed 100 patients aged 42 to 75 years old with heart failure and hypertension , which are during 6 months of receiving antihypertensive treatment with perindopril (10 mg) and amlodipine (10 mg) in combination with trimetizidinum (35mg × 2). The study was took in on patients with heart failure and hypertension with systolic blood pressure (SBP) - 170mmHg and diastolic blood pressure (DBP) - 100mmHg. Patients were divided into 3 groups. Group I included patients who received during 6 months only perindopril. II group consisted of patients receiving combination antihypertensive therapy with perindopril and amlodipine. In group III included patients receiving both perindopril and amlodipine with trimetazidin.

Results: The study showed that at the end of the first month of therapy in 68% of patients receiving 10 mg perindopril SBP decreased to 140mmHg and DBP to 90mmHg. However, in 31% of patients had episodes (3-4 times a month) of BP increase to 160/100mmHg. In group II patients receiving the combination of perindopril 10mg with amlodipine 10mg during 2-3 weeks of starting treatment in 84% SBP decreased to 140mmHg and DSP to 80mmHg. Episodes of BP increase were observed much less frequently (1-2 times per month). In group III patients, which together with antihypertensive therapy (combination perindopril and amlodipine) got trimetazidin, in 92 % of patients during 2-3 weeks of starting treatment BP decreased to 135 /80mmHg. In subsequent control observation during 6 months, episodes of BP increase were reduced almost to a minimum and only been observed in isolated cases.

Conclusions: This study showed that treatment patients with heart failure and hypertension antihypertensive therapy (appointment perindopril and amlodipine) should be combined with trimetazidin, which would help achieve more stable hypotensive effect and will minimize the possibility of episodes BP increase.

PP.36.31 QUINAPRIL AND HYDROCHLOROTHIAZIDE FIXED COMBINATION TREATMENT EFFECT ON LEFT VENTRICULAR HYPERTROPHY, BLOOD PRESSURE LEVEL AND METABOLIC DISTURBANCES AT PATIENTS WITH ESSENTIAL HYPERTENSION

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Objective: The aim of the study was to investigate the influence and safety of combined therapy by quinapril (Q) 20 mg and hydrochlorothiazide (H) 12,5 mg on left ventricular hypertrophy (LVH) reduction and blood pressure (BP) level decreasing at patients (pts) with essential hypertension 1st and 2nd stage and metabolic syndrome (MS) (according to IDF).

Design and method: We examined 36 pts (20 male, mean age 49,4±3,4 years) by echocardiography, 24h BP monitoring and performed biochemical analyses (fast glucose level (FGL), insulin level and HOMA estimation, lipidogram) before and after 6 months of treatment by fixed combination of Q and H. All pts were obese (mean body mass index 33,7±2,0 kg/m2).

Results: Treatment by combination of Q and H during 6 months coursed significant decreasing of BP, left ventricular mass (LVM, g) and LVM indexes (LVMI, g/m2,7 and g/m2). Systolic BP level changed: 124,4±3,1 vs. 141,1±2,2; diastolic BP - 81,3±5,5 vs. 91,2±6,1; LVM at male – 262,9±12,5 vs. 311,7±21,4; LVMI (g/m2,7) - 54,9±2,3 vs. 65,2±4,8; LVM at female – 207,5±10,5 vs. 249,7±18,2; LVMI (g/m2,7) - 55,0±2,4 vs. 66,1±5,1 (all $p<0,05$). Although LVM and LVMI (g/m2,7) have significantly decreased, but not achieved normal levels. However LVMI (g/m2) didn't show LVH presence after treatment at male- 115,0±4,0 and at female-108,7± 4,1. FGL after 6 months was 5,35±0,28 vs. 5,58±0,54; total cholesterol – 5,75±0,38 vs. 6,02±0,45; triglycerides - 1,47±0,32 vs. 1,66±0,41; height density lipoprotein -1,24±0,10 vs. 1,18±0,10 (mmol/l) and HOMA - 2,62±0,07 vs. 3,32±1,14.

Conclusions: Quinapril and hydrochlorothiazide treatment had beneficial effect on LVH and BP level in hypertensive patients. Method of LVH estimation as LVM/height 2,7 instead LVM/m2 at patients with metabolic syndrome and obesity allow to make more correct measurement and controlling LVH reduction during the treatment. Using quinapril and hydrochlorthiazide fixed combination improved metabolic disturbances due to protection action of quinapril and save dose of hydrochlorothiazide at patients with metabolic syndrome.

PP.36.32 EFFECT OF DIFFERENT DOSES FIXED COMBINATION ATORVASTATIN/AMLODIPIN (AMLATOR 10/5 AND AMLATOR 20/10) ON PARAMETERS OF ARTERIAL STIFFNESS

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Objective: Parameters of arterial stiffness (AS) are an early marker of atherosclerosis (functional parameters), before IMT (morphological parameters). The aim is to evaluate the correlation of AS parameters with clinical factors and echocardiographic measurements in patients with arterial hypertension, treated with fixed combination with atorvastatin and amlodipine.

Design and method: We studied 55 patients with arterial hypertension (57±16) and 10 normals (45±12) . E-tracking analysis was performed on the common carotid artery, bilaterally, and included: beta - Stiffness index, Ep – elastic modulus, AC- arterial compliance, AI Augmentation index , PWV. .All patients, divided on two groups with mild and sever AH, regarding the level of BP from AMBP, and lipid profiles,was analyzed at baseline before therapy and 4 months follow up.

Results: Patients with severe AH had higher W1 values (13.06 and 9.11, $p=0.001$) W1 correlated positively with EF ($r= 0.56$, $p=0.001$), LV hypertrophy ($r=0.48$, $p=0.05$, $r= 0.57$, $p=0.001$) and negatively with LVESV ($r=-0.43$, $p=0.01$, and -0.29, $p=0.01$). Were found higher AI (38.36±3.62, $p<0.001$), significant high PWV (13.6±3.7, $p< 0.01$) and lower AC (0.56±0.012, $p<0.001$) in AH group.We divided the patients into 3 groups with respect to their LV diastolic function (normal – 22 patients, impaired LV relaxation – 33 and impaired relaxation with reduced compliance– 10) were found: beta and W2 values showed significant between-group variation. B Blood pressure and lipid profiles at 4mFU were significantly lower from baseline. ($p=0.001$) in both fixed combination ($p<0.000$). At 4mFU we found more significant recovery in the group with severe AH on higher dose Amlator 20/10 for W1 , beta and AI (9.04 , 7.3, 36, $p<0.01$). 4mFU treatment in the both groups we find improvent, with a positive correlation between arterial stiffness parameters and E/Em,ratio and a negative correlation witk E/A ratio.

Conclusions: Parameters of arterial stiffness as an early marker of atherosclerosis and they have improvement after active fixed combination therapy with atorvastatin/amlodipine. Beta index of carotid artery stiffness can be useful in detection of early functional changes that precedes arterial structural remodeling in patients at cardiovascular risk.

PP.36.33 THE ANTIHYPERTENSIVE EFFICACY OF FREE VERSUS FIXED-COMBINATION OF PERINDOPRIL AND AMLODIPINE. THE SLOVAK EXPERIENCE

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Objective: This study aimed to assess the blood pressure-lowering effects of fixed-combination perindopril/amlodipine (P+A) in patients previously not treated to target blood pressure (BP) values with a free P+A combination.

Design and method: The studied patient cohort was enrolled in the SYMBIO trial, which was a prospective, open-label, longitudinal, phase IV study (Study Of Optimized Blood Pressure Lowering Therapy With Combination Perindopril/Amlodipine) conducted in Slovakia in the years 2010-2011. In total, 2132 poorly controlled hypertensive patients were enrolled, treated at baseline with an ACE inhibitor, calcium channel blocker, or an ACE inhibitor/calcium channel blocker combination and switched to the fixed combination of P+A (all other background treatments remained unchanged). A subgroup of these patients (n=694) was treated with the free P/A combination at baseline and switched to the fixed combination of the same drugs during the study.

Results: Switching to fixed-P+A-combination led already after one month to a significant decrease of both systolic and diastolic BP with a further decrease after 3 months of therapy (Table 1 on the following page).

BP Measurement	Systolic BP (mean ± SD)	Diastolic BP (mean ± SD)
Baseline on free P+A combination	155 ± 16 mm Hg	92 ± 10 mm Hg
1 month on fixed P+A combination	139 ± 12 mm Hg	84 ± 7 mm Hg
3 months on fixed P+A combination	131 ± 9 mm Hg	81 ± 6 mm Hg

Table 1: BP values during the 3 months follow-up within the SYMBIO trial

Target BP values were reached after 3 months by 72% of our patient cohort. Treatment was well tolerated and was associated with a 63% reduction in the number of patients with ankle edema.

Conclusions: The observed BP decrease achieved with a well tolerated fixed-combination of P+A was highly statistically significant, clinically relevant and persistent. Our results demonstrate the superiority of fixed over free P+A combination in achieving optimal BP control in real-life clinical practice.

PP.36.34 FIXED-DOSE COMBINATION FOR ANTIHYPERTENSIVE THERAPY IN THE COMMUNITY HEALTHCARE (FIX-CATCH): EFFICACY AND SAFETY AFTER 2 YEARS

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Objective: To observe the antihypertensive effects, safety and compliance between Compound Hypotensive (CH) and Compound Reserpine (CR) in mild and moderate essential hypertension patients in 2 years.

Design and method: 766 patients were randomly divided into two groups. The CH group took the medicine half or one tablet once a day. The CR group took the medicine three times once a day, one or two tablets per time. The blood pressure, adverse effects and compliance were compared.

Results: After 2-year treatment, 710 patients finished the study. The reduction of systolic blood pressure and diastolic blood pressure (24.7/13.2 mmHg vs. 23.0/11.9 mmHg) in CH group, as well as total effect rates (89.0% vs. 84.5%), was higher than that in CR group, but there were no significances between two groups (P>0.05). For the patients with Grade II hypertension, the reduction of diastolic blood pressure in CH group was higher than that in CR group (16.5mmHg vs. 14.3mmHg,P<0.05). Medicine compliance in patients with CH was higher than patients with CR (99.2±4.8 vs. 98.2±6.5, P<0.05). The occurrence rate of adverse effects with CH was lower than CR (0.5% vs. 1.35%, P>0.05).

Conclusions: Medicine compliance in patients with CH group, as well as the depressive effect in patients with Grade II hypertension, was significantly higher than that in CR group. There were no significant side effects observed between two groups and no severe adverse reactor occurred.

PP.36.35 PRORYV2 STUDY: THE INFLUENCE OF FIXED DOSE COMBINATION PERINDOPRIL/AMLODIPINE ON OFFICE AND AMBULATORY BLOOD PRESSURE IN PATIENTS WITH UNCONTROLLED HYPERTENSION

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Objective: The combination therapy, particularly fixed dose combinations (FDC), play a major role in improving blood pressure (BP) control, according to the new guidelines on arterial hypertension (AH) treatment. The aim of the PRORYV2 study was to investigate the influence of FDC Perindopril/Amlodipine on BP profile, as measured by three methods: office BP, 24 hour monitoring (ABPM), and self-control at home in patients with AH uncontrolled by the standard drug therapy.

Design and method: The patients aged 18-79 years, with essential AH and insufficient antihypertensive therapy, were included (office BP>140/90 mmHg, but<180/100 mm Hg; daily average value, according to ABPM data>135/85 mmHg). All participants provided written informed consent. The office BP measurement was performed initially, after 2 weeks, 1, 2, and 3 months of treatment; ABPM initially and after 3 months. Each patient performed BP self-control with the automatic device throughout the study, from the second week of treatment.

Results: 90 patients were included (53 males; mean age 52,7±12.2 years (M±SD); duration of AH 8.5±4.1 years). Before inclusion, all patients had been treated by mono- or combination therapy: ACE inhibitors (70% of the patients), angiotensin receptor blockers (12%), beta-blockers (29%), calcium antagonists (17%), and diuretics (22%). All medications, apart from beta-blockers, were replaced by FDC Perindopril/Amlodipine, prescribed by physician's decision (in the dose of 5/5 mg to 44 patients;10/5 mg to 30 patients; and 10/10 mg to 16 patients). Office BP had decreased from 161.4±9.9/94.8±7.5 to 127.7±8.5/77.8±6.0 mmHg at the end of the study (ð<0.0001); office HR had decreased from 76.3±9.0 to 69.9±6.1 bpm (ð<0.001). BP target levels (<140/90 mmHg) were achieved in 86% of the patients. Daily average BP decreased from 153.6±11.0/90.4±8.1 to 126.0±25.4/79.3±11.3 mmHg (ð<0.0001). The mean home BP dynamics was 148.4±16.5/88.4±10.5 mmHg - 125.2±10.3/76.8±7.3 mmHg (p<0.0001). 86 patients had completed the study protocol; withdrawal was due to non-medical reasons. No adverse events were registered.

Conclusions: BP-lowering effects of Perindopril/Amlodipine FDC were confirmed for the first time with the simultaneous use of three main methods of BP measurement (office, ABPM, and self-control). The target BP levels had been achieved in most of the patients.

PP.36.36 FORTISSIMO STUDY: GENDER DIFFERENCES IN IMPROVING QUALITY OF LIFE OF THE PATIENTS WITH ARTERIAL HYPERTENSION IN THE TREATMENT OF A FIXED COMBINATION PERINDOPRIL A/ INDAPAMIDE (10 MG/2.5 MG)

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Objective: To estimate gender differences in quality of life (QoL) in patients with an arterial hypertension (HT) and influence of therapy on change of QoL.

Design and method: The multicenter open postmarketing surveillance program FORTISSIMO carried out with the assistance of 700 doctors of out-patient centers in 51 regions of the Russian Federation. 2115 patients (718 men - 33,9%, 1397 women - 65,9%) with HT to whom doctors considered it necessary to appoint for treatment a fixed combination perindopril A/indapamide (10 mg/2.5 mg) were included in Program. QoL was evaluated by scale SF 36.

Results: Women included in the observation were significantly (p < 0.00001) older than men (mean age 60,2 ± 9,8 vs. 56,6 ± 9,4 years), more often has obesity (68,1 vs. 50,2%), 2 type diabetes (16 vs. 10,8%), arthritis (30,2 vs. 14,4%). At baseline women had significantly lower QoL score than men on all scales of the questionnaire. Most pronounced in women were reduced scale emotional and role functioning. To a lesser extent have changed the scale of mental health, vitality, general health assessment, body pain and physical functioning. After three months of therapy of a fixed combination perindopril A/indapamide provides similar office BP reduction in men and women. QoL improved significantly on all scales (P <0.00001), especially pronounced was an improvement on the scale of bodily pain, general health, mental health, role and emotional functioning. For all the scales in women improvement was more pronounced. For example, women role functioning score increased by 2.4 times, while men - 1.8 times. Emotional functioning in women increased almost by 2-fold, while in men - 1.6 times. Although the differences in the assessment of QoL in persons of different sex in the treatment of behavior became less pronounced, but the score in women remained significantly lower than in men.

Conclusions: QoL at women with HT is more deteriorate than at men. Antihypertensive therapy by fixed combination perindopril A/indapamide (10 mg/2.5 mg) improves QoL at women more than at men.

PP.36.37 GENDER-RELATED DIFFERENCES IN EFFICACY OF ANTIHYPERTENSIVE COMBINATION THERAPY WITH PERINDOPRIL A/INDAPAMIDE 10/2.5 MG

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Objective: To evaluate the influence gender on the antihypertensive efficacy of the fix-combination perindopril A /indapamide 10/2.5 mg (Noliprel A Bi-forte).

Design and method: Prospective cohort study of 36 patients with arterial hypertension (AH) 1-2 stage, previously untreated or poorly controlled on monotherapy. Effectiveness was assessed using office measurements of blood pressure (BP) and ambulatory BP monitoring (ABPM).

Results: Women were older than men (63.4 ± 11, 6 years vs 57.3 ± 15.2 years; p = 0.046), had a higher body mass index (31.9 ± 4.9 vs. 27.9 ± 4.0 kg/m2; p

= 0.013) and a trend towards a greater frequency of obesity (52% vs. 41%). Among women, there were fewer smokers than among men (5% vs. 41%; p = 0.007). Women have slightly more common retinal angiopathy, adverse family history, diabetes mellitus, thyroid disease. Treatment for 3 months led to the achievement of the target values of office systolic BP in 83% of patients and diastolic BP - 100% of patients. The treatment induced decrease of 24 h-BP from 153,1±21,1/90,1±13,7 mm Hg to 134,9±12,8/77±7,9 mm Hg women and from 144±13,1/80±7,9 mm Hg to 133,3±8,7/76,7±9,8 mm Hg in men. The decrease in ABPM parameters was more pronounced in men than in women. According to ABPM the target 24 h systolic BP reach 36% of women and 47% men, 24 h systolic pressure-time index < 25% reach 58% women and 71% men. Increased BP variability was reduced in the treatment fix-combination of perindopril A/indapamide 10/2.5 mg during the day and night hours for women from 43 to 33% and from 47 to 28%, respectively; males - from 53% to 31% and from 53% to 21%.

Conclusions: Fix-combination of perindopril A/indapamide 10/2.5 mg provides similar and expressed office BP reduction in men and women. For women, ABPM is more accurate and useful method of assessing the effectiveness of antihypertensive treatment. especially those with risk factors and target organ damage.

PP.36.38 AN ACE-INHIBITOR MAY PREVENT AMLODIPINE-ASSOCIATED PEDAL EDEMA MORE THAN AN ANGIOTENSIN RECEPTOR BLOCKER OR ALISKIREN

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Objective: To compare the incidence of pedal edema in hypertensive subjects treated in parallel-group clinical trials with the same dose of amlodipine vs. amlodipine + an inhibitor of the renin-angiotensin system.

Design and method: A systematic review of the literature provided data from 10 such trials of an angiotensin converting-enzyme inhibitor (ACE-I, 1 with 2.5 mg/d, 4 with 5 mg/d, and 5 with 10 mg/d of amlodipine), 11 trials with an angiotensin receptor blocker (ARB, 1 with 2.5 mg/d, 4 with 5 mg/d, and 6 with 10 mg/d of amlodipine), and 6 trials of aliskiren (2 with 5 mg/d, and 4 with 10 mg/d of amlodipine); some had multiple arms or used factorial designs. Meta-analyses were performed using standard methods, with fixed-effects models and indirect comparisons (across drug classes, J Clin Epidemiol. 1997;50:683-91).

Results: Across all doses, an ACE-I had the largest preventive effect on incident edema (120/1827 vs. 243/1845, summary odds ratio: 0.46, 95% confidence interval: 0.38-0.60, P < 0.0000000001), followed by an ARB (442/4712 vs. 487/3821, summary odds ratio: 0.77, 95% CI: 0.67-0.89, P < 0.0003), followed by aliskiren (269/2355 vs. 254/2067, summary odds ratio: 0.79, 95% CI: 0.65-0.96, P < 0.02). Indirect comparisons provided the following odds ratios (and 95% confidence intervals) for incident edema: For all amlodipine doses: ACE-I vs. ARB: 0.60 (0.33-0.87); ACE-I vs. Aliskiren: 0.59 (0.29-0.89); ARB vs. Aliskiren: 0.98 (0.74-1.22). For amlodipine 10 mg/d only: ACE-I vs. ARB: 0.78 (0.47-1.09); ACE-I vs. Aliskiren: 0.65 (0.32-0.97); ARB vs. Aliskiren: 0.83 (0.58-1.09).

Conclusions: These data suggest that an ACE-I is the most effective inhibitor of the renin-angiotensin system to prevent amlodipine-associated pedal edema, but the lack of head-to-head trials, the small numbers of research subjects reportedly experiencing pedal edema, "double counting" of events in factorial design studies, and the lack of simple statistical techniques to compute three-way analyses of variance limit the precision of these estimates.

PP.36.39 REAL-WORLD EFFECTIVENESS AND SAFETY OF AMLODIPINE/VALSARTAN AND AMLODIPINE/VALSARTAN/HYDROCHLOROTHIAZIDE IN ELDERLY, DIABETIC, OBESE, AND ISOLATED SYSTOLIC HYPERTENSION PATIENTS

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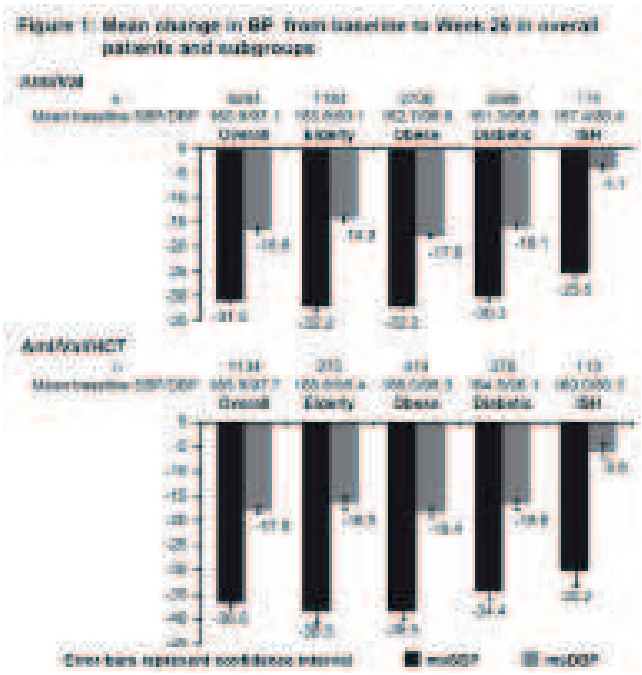
Objective: To evaluate the effectiveness, safety and tolerability of amlodipine/valsartan (Aml/Val) and amlodipine/valsartan/hydrochlorothiazide (Aml/Val/HCT) single pill combinations (SPCs) in patients with hypertension from the Middle East and Asia in a real-world setting.

Design and method: The EXCITE (Clinical EXperienCe of amlodIpine and valsarTan in hypErtension) study was a non-interventional, multicentre, prospective study of patients with hypertension receiving Aml/Val or Aml/Val/HCT, as part of their routine medical care, for at least 26 weeks. Data was pooled from 13 countries in the Middle East and Asia. Effectiveness was assessed by change from baseline in mean sitting SBP (msSBP) and mean sitting DBP (msDBP). Safety and tolerability were assessed by incidence of oedema, adverse events (AEs) and serious AEs (SAEs). Here we present data from subgroup analyses of elderly, diabetic, and obese patients in addition to those with isolated systolic hypertension (ISH).

Results: The total population included 8,603 treated with Aml/Val and 1,191 with Aml/Val/HCT; the subgroup populations are shown in Figure 1. In the overall population, 60.6% were males, the mean age was 53.2 years, and the mean duration of hypertension 5.9 years. 15.5% were elderly (>=65 years), 31.3% had concomitant diabetes, 32.5% were obese (body mass index [BMI] >=30 kg/m²) and 9.8% had ISH (SBP >=140 mm Hg and DBP <90 mm Hg). Clinically relevant and significant BP reductions with both SPCs were seen in each of the patient subgroups and were generally consistent with the overall population in this large real world setting (Figure 1). In the total population, AEs were reported in 10.6% of patients with the most frequent including oedema [2.2%], peripheral oedema [1.1%] and headache [0.9%].



Conclusions: These results provide evidence, from a large multiethnic real-world setting, that Aml/Val and Aml/Val/HCT are effective and well-tolerated SPC therapies in patients with hypertension, including the difficult-to-treat populations.

PP.36.40 COMPARISON OF RENAL EFFECTS BETWEEN TITRATION OF TELMISARTAN AND ADDITION OF AMLODIPINE IN HYPERTENSIVE PATIENTS WITH DIABETES TREATED WITH TELMISARTAN PLUS DIURETIC

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Objective: Urinary albumin excretion, even at levels below clinically defined thresholds for microalbuminuria, is associated with an increased incidence of cardiovascular and all-cause mortality and, thus, quite important target in the management of diabetes and/or hypertension. The present study tested the hypothesis that titration of telmisartan reduces urinary excretion of albumin than does addition of amlodipine in patients treated with a standard dose of telmisartan combined with a low-dose diuretic for the same degree of blood pressure reduction.

Design and method: Hypertensive patients with type 2 diabetes mellitus and microalbuminuria under treatment with a combination of a standard dose of tel-

misartan (40 mg/day) and a low dose of trichlormethiazide (1 mg/day) were randomly assigned to receive either an increased dose of telmisartan (80 mg/day) combined with trichlormethiazide (increased dose ARB group, age 68.1 ± 5.5 years, blood pressure 142.3 ± 7.8/80.4 ± 7.7 mmHg, n=20) or a combination consisting of telmisartan (40mg/day), trichlormethiazide, and amlodipine (5 mg/day) (triple combination group, 66.6 ± 6.0 years, 141.3 ± 5.8/79.8 ± 6.2 mmHg, n=20) for 6 months. The primary endpoint was a reduction in urinary albumin levels.

Results: Both regimens reduced blood pressure to a similar extent (133.3 ± 5.6/75.2 ± 6.9 and 130.6 ± 4.3/74.2 ± 4.5 mmHg, respectively), while the reduction in urinary albumin was greater in increased dose ARB (–37.4 ± 16.9%) than in triple combination regimen (–8.9 ± 23.7%; $p < 0.0001$). The reduction in urinary albumin was correlated with the reduction in blood pressure in the triple combination group, but not in the increased dose ARB group.

Conclusions: Up-titration of telmisartan more effectively reduces urinary albumin than addition of amlodipine in hypertensive patients with type 2 diabetes treated with a combination of telmisartan and diuretic for the same degree of blood pressure reduction. This beneficial effect on kidney observed after titration of telmisartan is greater than that expected from blood pressure lowering effects of this regimen.

PP.36.41 EFFECTS OF ENALAPRIL/LERCANIDIPINE COMBINATION ON SOME EMERGING BIOMARKERS IN CARDIOVASCULAR RISK STRATIFICATION IN HYPERTENSIVE PATIENTS

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Objective: To evaluate the effects of enalapril/lercanidipine combination on some emerging biomarkers in cardiovascular risk stratification of hypertensive patients, such as lipoprotein(a) (Lp[a]), soluble advanced glycation end products (sRAGE), soluble CD40 ligand (sCD40L), serum myeloperoxidase (MPO).

Design and method: Three hundred and forty-five outpatients, of both sex, with a first diagnosed essential hypertension (diastolic blood pressure (DBP) > 90 and < 110 mmHg and/or systolic blood pressure (SBP) > 140 mmHg and < 180 mmHg), and naïve to anti-hypertensive treatment were considered for enrollment in this randomized, double-blind, clinical trial. One hundred and twenty hypertensive patients were randomized to enalapril 20 mg, 110 to lercanidipine 10 mg, and 115 to enalapril/lercanidipine 20/10 mg fixed combination. We evaluated at baseline and after 6, 12, 18, and 24 months: SBP, DBP, fasting plasma glucose (FPG), lipid profile, Lp(a), sRAGE, sCD40L, and MPO.

Results: There was a decrease of blood pressure in all groups compared to baseline, even if enalapril/lercanidipine combination better reduced blood pressure compared to single monotherapies ($p< 0.05$ vs both enalapril or lercanidipine). No variations of lipid profile or FPG were recorded. Lp(a) was reduced by lercanidipine ($p< 0.05$ vs baseline), and by enalapril/lercanidipine ($p< 0.001$ vs baseline). Compared to enalapril, lercanidipine and enalapril/lercanidipine were more effective in decreasing Lp(a) ($p< 0.05$, and $p< 0.01$, respectively). sRAGE was increased by all treatments ($p< 0.01$ for enalapril, $p< 0.05$ for lercanidipine, and $p< 0.001$ for enalapril/lercanidipine), with enalapril being more effective than lercanidipine in increasing sRAGE ($p< 0.05$), and with the combination being more effective than single monotherapies ($p< 0.05$ vs enalapril, and $p< 0.01$ vs lercanidipine). sCD40L and MPO decreased with all treatments ($p< 0.01$ for enalapril, $p< 0.05$ for lercanidipine, and $p< 0.001$ for enalapril/lercanidipine). Enalapril/lercanidipine was more effective than enalapril and lercanidipine in reducing sCD40L ($p< 0.05$ for both), and more effective than lercanidipine in reducing MPO ($p< 0.05$).

Conclusions: Enalapril/lercanidipine fixed combination seems to be better than single monotherapies in reducing not only blood pressure, but also the levels of some emerging biomarkers in cardiovascular risk stratification of hypertensive patients.

PP.36.42 LESS INCIDENCE OF HYPOTENSION IN PATIENTS TREATED WITH FIXED COMBINATION THERAPY RESPECT TO THOSE WHO RECEIVED COMBINATION THERAPY WITH SEVERAL DRUGS

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Objective: Currently, the use of double or triple fixed combination therapy,is widely accepted for the treatment of patients (P) with moderate or severe hypertension (HTA). However, little is known about the incidence of hypotension in this group of patients, principally when they are compared to those receiving combination therapy but with individual drugs. To assess the control of hypertension and the incidence of hypotension in patients receiving fixed-dose combination compared with those receiving multiple drugs individually.

Design and method: We studied 216 patients with hypertension who received two or more drugs in combination for the treatment of HTA which were divided into two groups: Group I: 156 P (52 women and 104 men) received fixed combination therapy and Group II: 100 P (45 women and 55 men) who received combined treatment with individual drugs. All were evaluated for 52 weeks during which they did a daily control of hypertension by self-measurement in 3 times daily or as symptoms that had as fatigue, dizziness, palpitations, dyspnea.Also were assessed the number of times they went to the emergency room or to visit family doctor for symptoms attributable to hypotension (Nº. HIPOT), the average blood pressure (SBP and DBP), number of drugs (No. FAR) and average of age.

Results: Results were compared and we show in the following table:

DATOS	Edad	TAS	TAD	NºFAR	NºHIPOT
GRUPO I	68±5	136±4	81±3	2.3±1.1	43 P (27.5%)
GRUPO II	71±5	138±4	84±5	2.4±1.3	36 P(36%)*

* mean value of p ≤ 0.05

*means p value less that 0.05

Conclusions: Use of antihypertensive drugs in fixed combinations, produce fewer episodes of hypotension that combination therapy of individual drugs despite an apparently adequate control of BP values, although in our study these patients were higher than those in group I but without statistical significance. Should consider these data when selecting the appropriate treatment in our patients.

PP.36.43 BLOOD PRESSURE VARIABILITY AND HYPERTENSION CONTROL IN 3811 PATIENTS WITH DIFFICULT HYPERTENSION: THE VOLT'AGE STUDY

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Objective: To investigate the effect of a fixed combination of Perindopril and Amlodipine on blood pressure (BP) control, as well as its determinants, namely blood pressure variability, in patients with difficult hypertension.

Design and method: Eight hundred and twenty-eight general practitioners have included 3811 hypertensives, for whom they decided to modify the chronic antihypertensive treatment with addition of a fixed combination of Perindopril and Amlodipine at either of its 4 dosages: 5/5, 5/10, 10/5 or 10/10 mg. Only patients with "difficult hypertension" were included; decision to modify the chronic antihypertensive treatment was based on not-at-goal BP and/or poor compliance / tolerance. In total, 3811 patients (61% males, mean age: 63±11 years, 26.5% diabetes mellitus) were included, with BP measured both at baseline (at least at 3 different visits in order to calculate a BP variability) and at the next control visit (1-3 months).

Results: Baseline characteristics were as followed: SBP/DBP: 157±11/91±8

mmHg; BMI: 28.0±4.7 kg/m²; 58.8% of patients were treated with a monotherapy, 31% with 2 drugs and 7.9% with >2 molecules. In the 3811 participants, a mean reduction of 21.7±12.3 mmHg in systolic BP and 12.1±9.5 mmHg in diastolic BP was observed, and 61.8% achieved successful BP control. Furthermore, in multivariate regression analysis, reductions in BP were significantly higher in women (p=0.001), in lean patients (p=0.001), in patients with the higher baseline systolic BP coefficient of variation (p<0.001), and in relation with the highest doses of both Perindopril and Amlodipine (10 mg vs. 5 mg) (p=0.001).

Conclusions: In this open-label study, addition of a fixed combination of Perindopril and Amlodipine to BP regimen was efficient, in terms of BP control, for 61.8% of those patients with difficult hypertension. Furthermore, gender, baseline BP coefficient of variation level, obesity and drugs dosages were the major determinants of BP control.

PP.36.44 SELENIUM DEFICIENCY INCREASED THE HYPERTENSIVE EFFECT OF AN OMEGA-3 FATTY ACID DEFICIENT DIET

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Objective: Increased oxidative stress has been suggested to contribute to hypertension. Although omega-3 (ω-3) fatty acid deficiency has been shown to increase oxidative stress, development of hypertension has been inconsistent. The aim of the present study was to determine whether elimination of the antioxidant Se would lead to hypertension in rats maintained on an ω-3 fatty acid deficient diet, and to determine if there is other relationship in liver mRNA gene activity.

Design and method: At 7 weeks of age, male Sprague-Dawley rats (n=40) were divided into four groups and placed on semi-synthetic diets that contained identical amounts of protein (15%; from torula yeast 30% w/w), carbohydrate (53% w/w), fat (7% w/w), AIN-93G vitamins and minerals except for Se. The diets were either sufficient (ω-3+; 7% canola oil; α-linolenic acid) or deficient (ω-3-; 7% safflower oil; linoleic acid) in ω-3 fatty acid, and were either sufficient (Se+, 4.2 mg/kg) or deficient (Se-, less than 0.05 mg/kg) in Se. After 18 weeks on the diet, tail cuff blood pressure was assessed using an IITC blood pressure system. Liver glutathione peroxidise (GPx) mRNA expression was determined at the end of the experiment.

Results: Results obtained showed that animals maintained on a diet deficient in ω-3 fatty acid did not become hypertensive unless the diet was also deficient in Se (systolic blood pressure [ω-3+/Se+= 124.1±10.1 mmHg vs ω-3-/Se-=136.1±10.9 mmHg, P<0.05; ω-3+/Se+= 124.1±10.1 mmHg vs ω-3-/Se+=118.8±11.5 mmHg, ns]). In addition, Se deficiency did not alter blood pressure in animals maintained on the ω-3 sufficient diet. The GPx expression in the ω-3-/Se+ group was increased 59.17% compared with only an induction of 4.34% by ω-3-/Se- group (P<0.001).

Conclusions: Thus, these results indicate that Se and Selenoenzyme GPx, due to its antioxidant actions, can ameliorate the hypertensive effects that may occur due to an ω-3 fatty acid deficiency.

POSTERS' SESSION

POSTERS' SESSION PS37
INFLAMMATION AND IMMUNITY - PEPTIDES

PP.37.01 AUTOIMMUNE ASPECTS OF HYPERTENSION PROGRESSION

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Objective: Research over the past decades had been shown that components of innate and adaptive immunity play essential role in the pathogenesis of hypertension. The aim of this study was to determine the serum contents of interleukin-17 (IL-17), the quantity of antibodies to NR2-peptide and establish their relationships with risk factors in hypertensive patients.

Design and method: Ninety patients (57 men, 33 women) with essential hypertension and sixty post-stroke hypertensive patients (42 men, 18 women) mean age 57 ± 3 years had been prospectively included in this study. The control group consisted of 10 healthy normotensive volunteers (6 men and 4 women) aged 43 - 72 years, mean age 59 ± 4 years. To all patients the general clinical examination has been carried out as well as 24-hour blood pressure monitoring by conventional method. The level of IL-17 in serum was measured by ELISA using laboratory kits eBioscience (Austria). The quantitative content of antibodies to NR2-peptide was determined by method «Gold Dot Antibody Test» by laboratory kits Biotech Inc. (USA).

Results: Serum concentration of IL -17 and the number of antibodies to the NR2- peptide were significantly different in the study groups. The highest levels of investigated parameters were registered in post-stroke hypertensives. The IL-17 level was on 42%, quantity of of antibodies to the NR2- peptide was on 87% higher than in hypertensive patients without stroke ($p<0,05$). Normotensive volunteers were characterized by lowest concentrations of IL-17 and number of antibodies to the NR2- peptide. Strong correlative relationships were revealed between the amount of antibodies to NR2- peptide and the average 24-hour systolic and diastolic blood pressure levels ($r=0,33$; $r=0,27$) and nocturnal blood pressure fall ($r=-0,34$; $p<0,05$).

Conclusions: We assume that autoimmune components has been involved in the pathogenesis of hypertension. Obvious correlative relationship between the quantity of antibodies to the NR2-peptide and 24-hour blood pressure levels may indicate the influence of immune activation on the hypertension progression through the cerebral vessels damage.

PP.37.02 C-REACTIVE PROTEIN IS ASSOCIATED WITH DETERIORATED HEALTH RELATED QUALITY OF LIFE IN HYPERTENSIVE SUBJECTS

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Objective: The association between essential hypertension (EH) and low scores of health-related quality of life (H-rQoL) is well established, while inflammation is emerging as a precursor and predictor of cardiovascular disease. We assessed the hypothesis that there might be a possible association between high sensitivity C-reactive protein (hs-CRP), a time-honored marker of inflammation and H-rQoL, in the setting of EH.

Design and method: We studied 154 consecutive subjects (aged= 58 ± 17 years, male=78), with stage I-II untreated uncomplicated EH (office blood pressure=150/98 mm hg). In all participants venous blood samples were drawn for evaluation of hs- CRP levels. To assess the H-rQoL, the widely validated Short Form 36 (SF-36) General Health Survey questionnaire was administered. The SF-36 is a generic H-rQoL instrument that includes eight subscales. These subscales were further grouped into two summary scales: the physical component summary (PCS) and the mental component summary (MCS).

Results: There was a significant negative correlation between hs-CRP levels and scores in six dimensions of SF-36, thus with the total score (Table).
Table. Correlations of SF-36 Scores with hs-Crp.

SF-36 SCALES	SPEARMAN'S RHO	P-VALUE
Physical functioning	-0.484	0.003
Role physical	-0.314	0.005
Bodily pain	-0.517	0.001
General health	-0.383	0.027
Vitality	-0.378	0.032
Role emotional	-0.274	0.047
PCS	-0.477	0.005
MCS	-0.182	0.377
Total SF-36 Score	-0.432	0.004

Conclusions: There is an intriguing link between inflammation and low scores of health-related quality of life in the setting of essential hypertension. The pathophysiological substrate of these interrelationships needs further investigation through large scale prospective studies.

PP.37.03 CORRELATIONS BETWEEN LIPOPROTEIN(A) AND INFLAMMATORY MARKERS IN HYPERTENSIVE PATIENTS WITHOUT TARGET ORGAN DAMAGE

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Objective: Lipoprotein(a) [Lp(a)] is considered a potential causal, genetic, independent risk factor for cardiovascular disease. The aim of this study was to evaluate the relationship between Lp(a) and inflammatory markers (fibrinogen, hsCRP) in hypertensive patients without target organ damage.

Design and method: The study comprised 72 patients with arterial hypertension without target organ damage. It was evaluated the relationship of serum hsCRP and fibrinogen levels with Lp(a). Lp(a) and hsCRP were measured by a sandwich enzyme-linked immunoassay (ELISA). The statistically analysis was done using Pearson's test and Student's t-test. $p < 0.05$ was considered statistically significant.

Results: The values of Lp(a) were significantly lower in hypertensive patients without atherogenic dyslipidemia compared to hypertensive patients with metabolic syndrome (80 ± 45.48 vs 58 ± 49.25 mg/dl, $p < 0.001$). It was obtained with Pearson correlation test a positive and significant correlation between carotid Lp(a) and fibrinogen ($r = 0.67$, $p < 0.001$) and between Lp(a) and hsCRP ($r = 0.59$, $p < 0.001$).

Conclusions: Elevated Lp(a) plasma levels are associated with higher proinflammatory markers in hypertensive patients without target organ damage.

PP.37.04 INFLAMMATION, PLATELET REACTIVITY AND LEFT VENTRICULAR HYPERTROPHY IN HYPERTENSIVE PATIENTS WITH MYOCARDIAL INFARCTION

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Objective: The relation between left ventricular hypertrophy (LVH) and unfavorable cardiovascular prognosis in patients with essential hypertension may involve systemic inflammation and high platelet reactivity. There is no data regarding the relationship between inflammation, platelet activity and LVH in hypertensive patients with myocardial infarction.

Design and method: The measurement of platelet activity (assessed as platelet aggregation inhibition, by use of Plateletworks Aggregation Kits; Helena Laboratories, Beaumont, TX, USA), inflammation state (based on leukocyte levels on admission) and LVH (on the basis of echocardiographic examination by use of Deveraux formula) were performed in 56 patients with essential hypertension who were admitted due to myocardial infarction.

Results: Mean age of the study group was 65.36 ±12.57 years. There were 33 men (58.9%) and 23 women (41.1%). Of total, 26 patients had STEMI (46.4%) and 30 NSTEMI (53.6%). 34 patients (60.71%) had LVH (LVMass/BSA > 115 g/m2 for men and LVMass/BSA > 95 g/m2 for women). Significantly higher leukocyte level was noticed in patients with vs without LVH (10.69±2.98 vs 9.08±2.75 [103/mm3], p=0.0432). Tendency to stronger platelet aggregation inhibition was noticed in patients with LVH comparing to those without LVH (57.87%±21.11 vs 67.97±15.07%, p=0.0571).

Conclusions: During myocardial infarction, higher level of leukocytes occurs in hypertensive patients with left ventricular hypertrophy. Higher platelet activity might occur in this group of patients. The utility of the combining measures of inflammation, platelet function and left ventricular hypertrophy to enhance risk stratification and thus facilitate personalized therapy in hypertensive patients with myocardial infarction deserves further study.

PP.37.05 CLINICAL AND IMMUNOLOGICAL FEATURES OF HYPERTENSION AMONG IMMUNOCOMPROMISED PATIENTS

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Objective: To estimate the value of the method of evaluating the content of serum cytokine profile and local factions criteria as risk factors for an unfavorable course of hypertension among immunocompromised patients.

Design and method: The method included the study of the content of specific cytokines, inflammatory - TNF-alpha, IL-8, Y-INF and anti-IL-4 in serum and nasal secret. The cytokines were measured by IEM method using diagnostic test system Vector-Best (Russia). Blood serum, taken fasting in the morning from the ulnar vein served as the material for study. At the same time sample blood smears were taken from nasal mucosa in the nasal area between the partition and the lower turbinate.

Results: The main cytokine status violations, common for immunocompromised patients are hypertensive disorders in antiviral defense system and multidirectional changes in the content of specific proinflammatory cytokines - TNF-alpha, IL- 8. Detected violations are most manifest in the evaluation of local mucosal cytokine status among immunocompromised patients with hypertension. The data obtained is correlated to the severity of the clinical manifestations of hypertension and prognostic assessment of disease flow.

Conclusions: Formation of several forms of hypertension is accompanied by immune inflammation syndromes. Taking into account the growing numbers of immunocompromised patients in modern society, it is necessary to create relevant clinical diagnostic algorithms for forecasting hypertension in this group and optimizing methods of treatment.
Major disturbances in the immune system, common to immunocompromised patients are violation of the congenital and adaptive immunity of mucosal, pronounced changes in nonspecific and specific protection factors. Determination of cytokine concentration in serum and nasal secret allows to forecast the acute and chronic inflammatory processes.
The result of correlation between the clinical picture and cytokine status indicators demonstrates a high informative content rating profile of cytokines, especially local factions, and is the basis for the usage of a hypertension forecasting method for immunocompromised patients and later as a basis for developing treatment among this group of patients.

PP.37.06 CALCIFICATION AND INFLAMMATION MARKERS IN HYPERTENSIVE PATIENTS

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Objective: Osteoprotegerin (OPG) and the receptor activator of nuclear factor-kappaB ligand (RANKL) are inflammatory cytokines traditionally linked to the regulation of bone remodeling and vascular calcification in different pathologies. The aim of this study was to evaluate the OPG/RANKL system and to correlate the values obtained with inflammatory parameters such as fibrinogen and high sensitivity C reactive protein (hsCRP) in hypertensive patients with or without coronary artery disease (CAD).

Design and method: This study comprised 223 hypertensive patients with CAD angiographically confirmed and 74 healthy subjects (CONTROL group). In all patients surrogate markers of inflammation (fibrinogen and hsCRP) and markers of calcifications OPG and RANKL were determined. OPG and RANKL concentrations were determined by ELISA.

Results: The values of fibrinogen were significantly higher in hypertensive patients with CAD compared to hypertensive patients without CAD and CONTROL group (524.7±99.05 vs 357.3±57.59 vs 299.2±14.2 mg/dl, all p < 0.001). Significantly higher values of hsCRP were observed in hypertensive patients with CAD compared to hypertensive patients without CAD and CONTROL group (3.6±1.17 vs 3.2±1.48 vs 1.1±0.24 mg/l, all p < 0.001). Using the Pearson correlation test, significant positive correlations were obtained between OPG and fibrinogen (r = 0.667, p < 0.001) and OPG and hsCRP (r = 0.857, p < 0.001). RANKL was significantly negatively correlated with fibrinogen (r = -0.313, p < 0.001) and with hsCRP (r = -0.445, p < 0.001).

Conclusions: These findings suggest that OPG and RANKL could become useful and noninvasive tools in clinical practice for evaluation of vascular damage associated with surrogate markers of inflammation in hypertensive patients.

PP.37.07 INFLAMMATION AND HEART REMODELING IN HYPERTENSIVE PATIENTS

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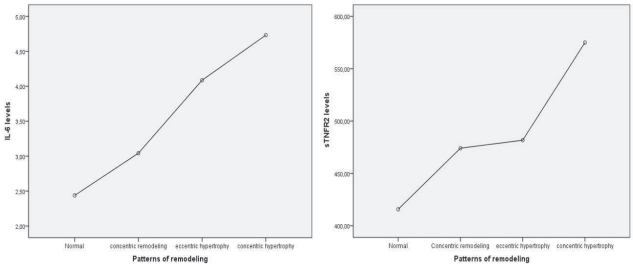
Objective: To investigate the relationship between inflammatory parameters and the patterns of heart remodeling in patients with essential hypertension.



Design and method: We studied 159 consecutive patients with treated essential hypertension. An exhaustive evaluation of heart with echocardiography was performed to determinate left ventricular mass index (LVMI) and relative wall thickness (RWT) and plasmatic levels of inflammatory (IL-6 and sTNF-R2) markers were determined. Patients were categorized in four groups based in LVMI and RWT: 1) Normal geometry (58 patients); 2) concentric remodeling (54 patients); 3) concentric hypertrophy (42 patients); and 4) eccentric hypertrophy (5 patients).

Results: The mean age of hypertensive patients was 56 ± 13 years, with 67.3% male, 45.3% had dyslipidemia, 30% were diabetic and 27.7% smokers. 87.4% of patients were treated with antihypertensive drugs. In the comparative study, we observed that patients with ventricular hypertrophy (concentric and eccentric) and concentric remodeling had significantly higher plasma levels of IL-6 and sTNF-R2 that patients with normal geometry (figure). Furthermore a positive correlation between plasma levels of both molecules and LVMI was found (r = 0.176, p <0.01 for IL-6; r = 0.261, p <0.001 for sTNF-R2).

Conclusions: Our study show a greater inflammatory activation in patients with left ventricular hypertrophy and in those with concentric remodeling compared with hypertensive patients with structurally normal heart.

PP.37.08 ARTERIAL HYPERTENSION, INFLAMMATION AND HIGH-SENSITIVITY C-REACTIVE PROTEIN

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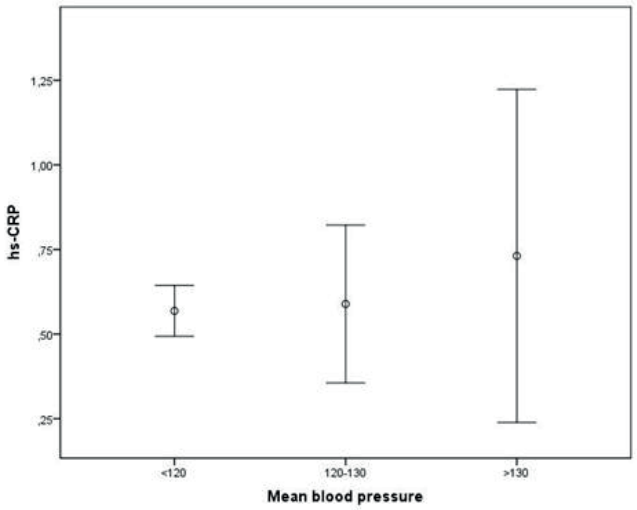
Objective: The arterial hypertension (AHT) is associated with a pro-inflammatory state with cytokine release and increased levels of high sensitivity C-reactive protein (hs-CRP). This marker is an independent risk predictor of myocardial infarction, stroke, peripheral vascular disease and death and its validation should be estimated in all populations.
Our objective was to investigate whether the plasmatic levels of hs-CRP are increased in a hypertensive population and whether blood pressure (BP) is an independent determinant of hs-CRP levels in this population.

Design and method: We performed a case-control study with 993 individuals, 513 hypertensive patients (mean age 51.2±7.9 years) and 480 normotensive (mean age 50.8±7.3 years). In both, demographic data, traditional risk factors and biochemical parameters, including hs-CRP were analyzed and compared. Chi-squared test, Fisher's exact test or Student's t-test were used when it was appropriate. Pearson correlation coefficient was used to estimate the correlation between hs-CRP and BP and linear regression analysis has estimated whether BP was an independent determinant of hs-CRP levels. The p-values less than 0.05 were considered significant.

Results: The mean plasma levels of hs-CRP were significantly higher in cases-0.269 mg/dl as compared to controls -0.221mg/dl (p <0.0001). A positive correlation was found between BP and hs-CRP (r = 0.117; P <0.0001). The linear regression analysis with age, BMI, smoking, LDL, HDL and diabetes, showed that BP was an independent determinant of hs-PCR levels.

Conclusions: Patients with high blood pressure had increased levels of hs-CRP and the BP was an independent determinant of these levels. Knowing that hs-CRP is also an independent predictor of future cardiovascular events, strategies targeted to lower blood pressure and reduce vascular inflammation (weight loss, statins, aspirin, high doses of tocopherol) may potentially provide increased clinical benefit.



PP.37.09 IL-18 PREDICTS CARDIAC ORGAN DAMAGE IN A POPULATION OF HYPERTENSIVE PATIENTS

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Objective: Hypertensive patients (HTs) develop arterial and cardiac damage (TOD) which is a marker of cardiovascular-CV-morbidity. Inflammatory activation is also an important determinant of cardiovascular status. Interleukin-18 (IL-18), a strong predictor of CV disease and death, has been related to plaque progression and vulnerability. We investigated whether IL-18 plays a role in TOD development in the arteries and heart in an essential hypertensive population.

Design and method: We performed arterial and cardiac measurements (carotid-femoral pulse wave velocity (PWV), common carotid intima–media thickness (IMT) and standard echocardiography) and we measured systemic inflammatory markers (IL-18; interleukin 6, IL-6; serum-amyloid A, SAA; C-reactive protein, CRP) in 568 well-controlled HTs (age 55.1±13.0 years, BP=138/84±22/13 mmHg, means ±SD) without manifest cardiovascular disease.

Results: IL-18 level was higher in HTs with left ventricular hypertrophy (LVMI>115 in Male/95 in female, g/m2) (236.7vs268,3 pg/mL, p=0.0012) and high PWV(>12 m/s) (245.7vs267 pg/mL, p=0.0473). On the contrary, no difference was found for the other inflammatory markers. IL-18 level was correlated with both LVMI and PWV (LVMI: r=0,185, p<0.0001; PWV: r=0,124, p=0,003). However, multivariable analysis adjusting for age, systolic and diastolic arterial pressure (SBP, DBP) and BMI showed independent association of IL-18 level only with LVMI (linear regression: beta= 0.0658, p<.0001). No relationship was found between IL-18 and IMT.

Conclusions: IL-18 level is increased in HTs with arterial and cardiac damage. Anyway, IL-18 is independently associated only with LVMI taken as a surrogate of cardiac TOD. This finding underlines the important role of IL-18 on cardiac damage development, and stresses the contribution of specific pattern of inflammation markers to the pathophysiology of heart and arterial disease.

PP.37.10 DOPAMINERGIC SYSTEM IN IMMUNE CELLS: A DISTINCT PATTERN IN CENTRAL OBESITY

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Objective: Inflammation is a key feature of Central Obesity (CO) and its comorbidities. Peripheral blood mononuclear cells (PBMCs) are exposed to systemic factors, such as dyslipidemia and inflammatory molecules.
Dopamine (DA) may be involved in obesity through its role both in the CNS and in periphery, where it is synthesized by immune cells and modulates their function through DA receptors (DRD1-5). Whether peripheral dopaminergic system is implicated in inflammation linked to CO and comorbidities is unknown. We aimed to study the expression of DRD and tyrosine hydroxylase (TH), the rate-limiting step in DA synthesis, in PBMCs and its relation with inflammatory and metabolic parameters in blood donors.

Design and method: DRD1-5 and TH expression was assessed by semi quantitative real-time PCR in PBMCs obtained from 30 healthy donors, 16 with CO and 14 without CO, according to the International Diabetes Federation criteria by using waist circumference (>=80 cm for women and >=94 cm for men). The ratio (R) was calculated between DRD and TH mRNA expression between individuals with and without CO. R <0.5 was considered under and >2.0 over expression. Lipid and leptin plasmatic levels were determined. Monocyte subpopulations (pro-inflammatory CD14+CD16+ and classical CD14+CD16-) were investigated by flow cytometry using CD14, CD16, CD11b and CD36 markers.

Results: CO individuals showed higher plasmatic levels of VLDL, cholesterol, triacylglycerol and leptin compared with non-centrally obese. While DRD1 was undetected in PBMCs, no differences were found in DRD3 and DRD4 expression between groups. DRD2 (R=0.25; p=0.001), DRD5 (R=0.13; p=0.001) and TH (R=0.43; p=0.004) were under expressed in CO in comparison with non-CO. The number of CD16+ monocytes was similar in both groups, but these cells in CO showed lower cellular complexity (p=0.006) and lower CD11b, CD14 and CD36 expression (p=0.001, p=0.005, p=0.010, respectively). DRD2 expression was positively correlated with both TH (r=0.771; p<0.001) and CD11b (r=0.927; p<0.001). VLDL, triacylglycerol and leptin plasmatic levels correlated negatively with the expression of DRD2 in PBMCs.

Conclusions: Immune cells in central obesity show a distinct dopaminergic pattern that is associated with a higher inflammatory phenotype and a more atherogenic lipid plasmatic profile.

PP.37.11 CAPABILITIES OF SYSTEMIC ENZYME THERAPY IN CORRECTION OF INFLAMMATION AND OTHER COMPONENTS OF METABOLIC SYNDROME IN EXPERIMENTAL CONDITIONS

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Objective: Evaluation metabolic disorders in conditions of chronic inflammation and capabilities of therapeutic impact of systemic enzyme therapy (SET) in animal model.

Design and method: We examined 40 rabbits which were kept on high-lipid diet for 8 weeks: 20 rabbits without treatment(1st group), 20 rabbits which took SET from 1st day of experiment (2nd group). At the beginning of the study and after 8th week blood of rabbits was examined on inflammatory intensity (CRP, circulating immune complexes (CIC), Cholesterol in CIC, Triglyceride in CIC), activity of angiotensin-converting enzyme (ACE act.), lipid levels (Chol.,TG., HDL-C, LDL-C), glucose and HbAlc. Tissue sensitivity to insulin was evaluated in all rabbits.

Results: In the 1st group at the end of the study CRP levels increased in 18 times ($p<0,001$), ACEact. increased in 3.5 times ($p<0,001$), tissue sensitivity to insulin decreased nearly 86% ($p<0,001$), glucose level increased for 90%, HbAlc - in 3,7 times ($p<0,001$) in comparison with baseline. TG level increased in 3,4 times, HDL-C level was reduced for 41%, TG CIC and Chol.CIC levels were in 5,6 and 4,5 times higher properly on 8th week ($p <0,001$). The positive correlation was found between CRP and TG CIC ($r=0,9$; $p<0,02$), glucose ($r=0,6$; $p<0,05$), HbAlc ($r=0,73$; $p<0,05$). In the 2nd group were found 4 times lower levels of CRP ($p<0,001$), 40% lower level of ACE act. ($p<0,01$), lower levels of TG CIC and Chol.CIC (64% and 62% properly, $p<0,001$) in comparison with the 1st group. In the 2nd group systemic lowering of sensitivity to insulin was in 2,5 times reduced, glucose and HbAlc levels were decreased approximately for 20% and 48% properly at the study end ($p<0,001$).

Conclusions: Keeping rabbits on high-lipid diet resulted in development of metabolic disorders typical for metabolic syndrome. Using SET from 1st day of high-lipid diet led in reduction of inflammation intencity and immune reactivity, restoration of tissue sensitivity to insulin, normalization of lipid composition in blood an reduction of it`s atherogenic.

PP.37.12 TELMISARTAN MONOTHERAPY EFFECTS ON NON-SPECIFIC INFLAMMATION STATUS IN PATIENTS WITH UNCOMPLICATED ARTERIAL HYPERTENSION

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Objective: To study telmisartan monotherapy effects concerning non-specific inflammation status in patients with uncomplicated arterial hypertension (AH).

Design and method: 32 patients (age 51,6±12,2 years; male -68,8%) with untreated uncomplicated grade I-II AH are included into the study. All patients were treated by telmisartan 80 mg during 8 weeks. At baseline and after 8 weeks markers of non-specific inflammation hsCRP, TNF-α, IL- 1β, IL-4, IL-6 were evaluated. Data presented as Median (interquartile range). Wilcoxon criteria for by-pair comparisons was used. $p<0,05$ was considered significant.

Results: After 8 weeks of treatment BP decreased from 154,7 (148;155,8)/96 (95,2;98,8) mmHg to 136,3 (132,6;140)/86 (77,3;90,9) mmHg ($p=0,0077$). 56,3% of surveyed have reached target BP levels <140/90 mmHg. 28,1% responded to treatment determined as decrease in systolic BP >20 mmHg or diastolic BP>10 mmHg.
hsCRP decreased from 0,14 (0,13;0,18) to 0,2 (0,08;0,29) mg/dl. Significant decrease ($p<0.05$) of TNF-α, L-1β, IL-6 was observed: TNF-α decreased from 24,8 (18;33) to 14,3 (9;19) pkg/ml, IL-1β decreased from 232 (153;559) to 195 (122;403) pkg/ml, IL-4 decreased from 564 (79;729) to 476 (102;570) pkg/ml, IL-6 decreased from 431,8 (103;734) to 337 (98;545) pkg/ml
Inflammation markers dynamics found in those who achieved target BP and those who failed to achieve target BP. No correlation was found between changes in BP and inflammatory markers.

Conclusions: Telmisartan monotherapy 80 mg contributes to lower non-specific inflammation level independently on reaching target BP after 8-weeks of treatment.

PP.37.13 RELATIONSHIP BETWEEN BLOOD PRESSURE AND INFLAMMATORY AND RENIN-ANGIOTENSIN-ALDOSTERONE SYSTEM BIOMARKERS IN UNCOMPLICATED ARTERIAL HYPERTENSION

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Objective: To evaluate correlation between biomarkers of subclinical inlammation and renin-angiotensine-aldosterone system (RAAS) activity in untreated hypertensive patients.

Design and method: In 112 patients (age 53.0±1.0 years; male 53.6%) with untreated uncomplicated grade I-III arterial hypertension the markers of subclinical inflammation (hsCRP, TNF-α,IL1β, IL4, IL6) and RAAS activity (angiotensine I (AI), plasma rennin activity (PRA) were measured. Spearmen correlation analysis was done to evaluate relationship between variables.

Results: Subjects with grade 1 arterial hypertension (AH) as compared to patients with grade II or III AH had significantly ($p<0,05$) lower values of hsCRP (0.26±0.03, 0.48±0.08, 0.56±0.06 mg/dl, respectively), TNF-α, (44.3±5.9,72.7±13.0, 108.5±13.1 pg/ml, respectively), IL1β (166.4±25.5, 318.4±57.6, 325.6±55.8 pg/ml , respectively), IL6 (184.0±24.0, 443.9±52.9, 322.742.6 pg/ml, respectively) and IL4/IL6 ratio (1.2±0.1, 1.0±0.1, 0.7±0.1, respectively). There was positive correlation between systolic BP, diastolic BP and pulse pressure with hsCRP, respectively, $r=0.31$ ($p<0.01$), $r=0.26$ ($p<0.05$) and $r=0.20$ ($p<0.05$); TNF-α, respectively, $r=0.38$ ($p<0.001$), $r=0.24$ ($p<0.05$) and $r=0.32$ ($p<0.01$); IL1β, respectively, $r=0.40$ ($p<0.001$), $r=0.24$ ($p<0.05$) and $r=0.31$ ($p<0.01$); IL6, respectively, $r=0.36$ ($p<0.001$), $r=0.31$ ($p<0.01$) and $r=0.21$ ($p<0.05$). IL4 directely correlated with systolic BP $r=0.25$ ($p<0.05$). PRA and A1 correlated to hsCRP ($r=0.55$ ($p<0.001$) and $r=0.29$ ($p<0.05$), respectively); TNF-α ($r=0.61$ ($p<0.001$) and $r=0.46$ ($p<0.01$), respectively; IL1β $r=0.66$ ($p<0.001$) and $r=0.55$ ($p<0.001$), respectively; IL4 $r=0.40$ ($p<0.01$) and $r=0.42$ ($p<0.01$), respectively; IL6 $r=0.54$ ($p<0.001$) and $r=0.47$ ($p<0.001$), respectively; and inversely – with IL4/IL6 ratio $r=-0.35$ ($p<0.05$) and $r=-0.30$ ($p<0.05$, respectively).

Conclusions: The significant correlation between inflammatory and RAAS biomarkers and BP may reflect their input into pathogenesis of arterial hypertension and may explain modification of subclinical inflammation by RAAS-inhibiting BP-lowering agents.

PP.37.14 CYSTATIN C AND SUBCLINICAL INFLAMMATION MARKERS IN THE ESSENTIAL HYPERTENSION PATIENTS

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Objective: Cystatin C is a novel endogenous marker of kidney function and also correlates of cardiovascular risk factors. Some author's postulated role of Cystatin C as a marker of subclinical inflammation. The aim of our study was to investigate association Cystatin C with subclinical inflammation markers and blood pressure parameters in the essential hypertensive patients (EH pts).

Design and method: 47 EH pts (30M, 17F) grade 1 or 2, av. age 46,0±1,8 years with short duration EH (no more 5 years) and without chronic kidney disease (Creatinine level: 84,7±1,9 μmol/L, Glomerular fultratiion rate (GFR): 114,9±5,4 ml/min), 24-h SBP was 139,7±1,8mm.Hg., 24-h DBP was 84,8 ±1,7 mm Hg. Cystatin C was defined by a method of turbidimetry on the Architect C 8000 analyzer (Abbot, USA). GFR was calculated by MDRD formula. High-sensitivity CRP was defined by a method of turbidymetry. Plasmatic malondialdehyde (MDA) production was assessed by a modified thiobarbituric acid assay. Total antioxidant activity (AOA) blood serum was determined by liquid chromatography with electrochemical detection. Serum uric acid (SUA) was defined by a UF method on the uricase selective analyzer. 24 hour blood pressure monitoring (24-h BPM) was carried out by BPlab (Russia).The statistical analysis was carried out by nonparametric methods of Mann-Whitney with STATISTICA 10. The data is presented as M±SE.

Results: We didn't found significant association Cystatin C with subclinical inflammation markers and blood pressure parameters in the essential hypertensive patients (EH pts) (Table on the following page).

Parameters	High Cystatin C (n=37)	Normal Cystatin C (n=10)	P, value
CRP (mg/L)	4,2±1,3	2,1±0,4	n/s
MDA (nmol/mg)	3,5±0,4	2,8±0,7	n/s
AOA (mM)	0,37±0,05	0,33±0,10	n/s
SUA (μmol/L)	323±12	322±16	n/s
24-h SBP (mm Hg)	138,2±1,9	138,7±2,9	n/s
24-h DBP (mm Hg)	85,6±1,9	84,3±2,9	n/s

Conclusions: Our results not demonstrated an association between association Cystatin C with subclinical inflammation markers and blood pressure parameters in the EH pts. Average age of EH pts, as well as short hypertension history and no chronic kidney disease may explain the result.

PP.37.15 CIRCULATING SERUM LEVELS OF MATRIX METALLOPROTEINASE-9 AND VASCULAR ENDOTHELIAL GROWTH FACTOR-A IN ATHEROSCLEROSIS OF HYPERTENSIVE PATIENTS WITH CKD AND GLOMERULONEPHRITIS

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Objective: Gelatinase-B, reported also as matrix metalloproteinase-9 (MMP-9), is a proteolytic enzyme that has been implicated in chronic kidney disease (CKD) and cardiovascular disease (CVD). Recent evidence suggests that renal vascular changes contribute to progressive renal disease and that alteration of vascular endothelial growth factor-A (VEGF-A) might play an important role in modulating microvascular loss of macrovascular remodeling in the kidney, as well as in the vessels. It remains controversial the mechanism by which VEGF works in the kidney, as well as in the vessels at least in the early stages of CKD. The aim of the present study was to determine the serum levels of MMP-9 and VEGF-A and to investigate their potential correlation with the atherosclerotic markers and albuminuria in hypertensive patients in early stages of CKD and primary chronic glomerulonephritis (CGN).

Design and method: CKD patients of stages 1 and 2 with CGN (n=40) were included. As controls, there were healthy individuals (n=40). Clearance of creatinine (Clcr) and albumin excretion were examined in the 24h urine. VEGF-A and MMP-9 levels were measured by an ELISA method. Intima media thickness (IMT) of carotid and femoral arteries and atheromatic plaque were evaluated by a high resolution ultrasonography. Statistical analysis was performed with the use of a SPSS system.

Results: The levels of VEGF-A were 646.3±130.5pg/ml in CGN vs 197.7±115.9pg/ml in healthy and their difference is 12541 ($p<0.0001$). The difference between MMP-9 levels in CGN and healthy individuals was 132664 ($p<0.0001$). MMP-9 serum levels were strongly correlated with VEGF-A serum levels in the group of CGN (pearson correlation 0.520, $p<0.0001$). There was a statistically significant correlation between levels of VEGF-A, MMP-9 and albuminuria ($p<0.0001$). Further, VEGF-A and MMP-9 levels were independently correlated with IMT and atheromatic plaque ($p<0.0001$). This association seems stronger under the presence of hypertension.

Conclusions: Our study suggests that serum levels of VEGF-A and MMP-9 might present independent risk factors of atherosclerosis and albuminuria, in hypertensive patients in early stages of CKD and CGN to the progression of CKD.

PP.37.16 INCREASED CIRCULATING SERUM LEVELS OF TGFB-1 AND MMP-2 ARE ASSOCIATED WITH THE PROGRESSION OF CHRONIC KIDNEY DISEASE IN HYPERTENTION OF PRIMARY CHRONIC GLOMERULONEPHRITIS

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Objective: Matrix metalloproteinase-2 (MMP-2) is considered to be the main enzyme that degrades collagen type-IV (col-IV) and has been implicated in chronic kidney disease (CKD) and cardiovascular disease (CVD). Col-IV is the major collagenous component of the extracellular matrix (ECM) which constitutes the architectural structure of the vessels basement membrane (BM) and the glomerular BM (GBM). Transforming growth factor β-1 (TGFβ-1) is involved nowadays in atherosclerosis and proteinuria. Albuminuria is considered to be one of the most important agents for the onset and progression of renal dysfunction in CKD and more recently, it has also been implicated in CVD and peripheral vascular disease. Conflicting studies cannot establish at present a clear role for TGFβ-1 in the pathogenesis of diabetic albuminuria and atherosclerosis. The aim of the present study was to investigate the serum levels of TGFβ-1 and MMP-2 and their potential role in atherosclerosis and albuminuria in hypertensive patients with early stages of CKD and primary chronic glomerulonephritis (CGN).

Design and method: CKD patients of stages 1 and 2 with CGN (n=40) were included. Patients with active inflammatory disease or malignancy were excluded. As controls, there were healthy individuals (n=40). TGFβ-1 and MMP-2 levels were measured by an ELISA method. Intima media thickness (IMT) of carotid and femoral arteries and atherosclerotic plaque were determined by a high resolution ultrasonography.

Results: The levels of MMP-2 were significantly higher in patients than in the control group ($p<0,036$). It should be noted that the patient group had the largest and highest mean level of TGFβ-1 (6802,57±5349pg/ml in CGN vs 1107±280,83 pg/ml in healthy). Clcr and albumin excretion levels were statistically different between patients and controls ($p<0,001$). There was a statistically significant correlation between levels of TGFβ-1 and MMP-2 and albuminuria ($p<0,002$). TGFβ-1 and MMP-2 levels were independently correlated with IMT and atheromatic plaque ($p<0,004$).

Conclusions: This study suggests that serum levels of TGFβ-1 and MMP- 2 were found to be independent risk factors of atherosclerosis as well as of albuminuria in hypertensive patients in early stages of CKD and CGN.

PP.37.17 INCREASED SERUM LEVELS OF MATRIX METALLOPROTEINASE-2 ARE ASSOCIATED WITH HYPERTENSION AND SECONDARY HYPERPARATHYROIDISM IN EARLY STAGES OF TYPE 2 DIABETIC NEPHROPATHY

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Objective: Several matrix metalloproteinases (MMPs) are expressed in bone function in endochondral ossification during embryonic development and in remodeling of bone postnatally and later in life. Clinical and experimental evidence support a role for the MMPs in promoting osteoclastic bone resorption, but the precise molecular mechanisms are not yet fully understood. Matrix metalloproteinase-2 (MMP-2) has been implicated in chronic kidney disease (CKD) and atherosclerosis and is important in humans for osteogenesis. However, to date the possible role of MMP-2 in secondary hyperparathyroidism (SHP) is still unclear. Diabetes mellitus is the main cause of end-stage renal disease and SHP starts earlier in those patients. Parathormone (PTH) is currently known as biochemical marker of SHP. The aim of this study was to investigate the serum levels of MMP-2 and its potential correlation with PTH in hypertensive patients with SHP in early stages of type 2 diabetic nephropathy (DN).

Design and method: CKD patients (n=40) of stages 1 and 2 with type 2 DN were included. As controls, there were two groups, patients with diabetes type 2 without CKD (n=30) and healthy individuals (n=30). MMP-2 levels were measured by an ELISA method. PTH is measured by electrochemiluminescence. Intima media thickness (IMT) of carotid arteries and was evaluated by a high resolution ultrasonography. Statistical analysis was performed with the use of a SPSS system.

Results: The levels of MMP-2 were significantly higher in patients than in the control groups and their difference is 341 32 ($p<0.0001$). PTH levels were also significantly higher in patients than in the control groups and their difference is 3.70.9 ($p<0.02$). Further, MMP-2 levels were independent correlates of IMT ($p<0.0001$), albuminuria ($p<0.004$) and PTH ($p< 0.0001$).

Conclusions: This study suggests that serum levels of MMP-2 were strongly correlated with PTH as well as with hypertension and albuminuria, attributing a role for MMP-2 in secondary hyperparathyroidism in DN patients. MMP-2 might present an independent correlate of secondary hyperparathyroidism in early stages of CKD.

PP.37.18 EFFECTS OF FISH OIL SUPPLEMENTATION ON INFLAMMATORY MARKERS IN CARDIOVASCULAR DISEASE: A META-ANALYSIS OF RANDOMIZED CONTROLLED TRIALS

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Objective: Effects of fish oil on systematic inflammation in cardiovascular disease remain unclear. In this meta-analysis, we aimed to evaluate the influence of fish oil supplementation on circulating levels of inflammatory markers in patients with cardiovascular disease.

Design and method: Human randomized controlled trials, which compared the effects of fish oil supplementation with placebo in patients with chronic heart failure, were identified by systematic search of Medline, Embase, Cochrane's library and references cited in related reviews and studies up to November 2013. Outcome measures comprised the changes of circulating inflammatory markers. Meta-analysis was performed with the fixed-effect model or random-effect model according to the heterogeneity.

Results: A total of twelve trials with ten study arms were included. The pooled results indicated circulating levels of tumor necrosis factor alfa (SMD = -0.62, 95% CI -1.08 to -0.16, p = 0.009), interleukin 1 (SMD = -1.24, 95% CI -1.56 to -0.91, p < 0.001) and interleukin 6 (SMD = -0.81, 95% CI -1.48 to -0.14, p = 0.02) were significantly decreased after fish oil supplementation; however, high sensitivity C reactive protein, soluble intracellular adhesion molecular 1 and vascular cell adhesion molecular 1 were not significantly affected. Meta-regression and subgroup analysis results suggested the difference in dose of fish oil and follow-up duration might influence the effects of fish oil on tumor necrosis factor alfa and interleukin 6. Greater reduction of these two markers might be achieved in patients taking fish oil of a higher dose (over 1000 mg/day) or for a longer duration (over 4 months).

Conclusions: Limited evidence suggests anti-inflammation may be a potential mechanism underlying the beneficial effects of fish oil for chronic cardiovascular disease. Further large-scale and adequately powered clinical trials are needed to confirm these effects.

PP.37.19 IMPACT OF VASOACTIVE PEPTIDES ON VASCULAR REMODELING IN HIGH RISK HYPERTENSIVE PATIENTS

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Objective: Vascular remodeling is an integral component of the hypertension progression and pathogenetic factor for the development of cardiovascular complications. Timely assessment of the vascular state as well as vasoactive substances - mediators of remodeling is undoubtedly important for cardiology practice. The aim of the study was to determine the plasma concentration of endothelin- 1 (ET -1) and transforming growth factor -beta 1 (TGF-beta1), to evaluate the relationship of these peptides with the remodeling of the extracranial arteries (ECA) in high risk hypertensive patients.

Design and method: We examined 53 patients (30 men , 23 women) with essential hypertension in high-risk scale SCORE. Mean age was 57 ± 4 years. The control group consisted of 20 healthy volunteers, aged 50 ±7 years. All patients and volunteers gave written informed concern, had been clinically examined. The serum levels of ET- 1 and TGF-beta 1 were measured by ELISA with Biomedica kits. Echolocation of ECA has been made by standard method with measuring of carotid intima -media thickness (IMT) as well as internal diameter of common carotid artery (CCA) in diastole d and the ratio IMT/d.

Results: In group of hypertensive patients the significantly higher levels of ET-1 and TRF -beta 1 were observed compared with the control group (0,75 ± 0,02 fmol/ml and 260 ± 15 ng /ml vs. 0,45 ± 0,03 fmol/ml and 130 ± 9 ng/ml in the control group) so as IMT CCA (0,98 ± 0,03 vs 0,67 ± 0,06 mm). The elevation of vasoconstrictor peptide ET-1 had been associated with hyperlipidemia and followed formation of a concentric type of vascular remodeling. Elevation of TGF-beta 1 plasma levels of in hypertensive patients had been progressively related to target organs damage and specifically to processes of initiation and manifestation of IMT CCA hypertrophy.

Conclusions: Concentric hypertrophic type of CCA remodeling is typical for high risk hypertensive patients and has been formed in the presence of high plasma concentration of endothelin-1 and transforming growth factor -beta 1.

PP.37.20 INCREASED BRAIN CONCENTRATIONS OF OREXIN-A IN SPONTANEOUS HYPERTENSIVE RATS

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Objective: Orexin-A and neuropeptide Y (NPY) are representative potent appetite-stimulating neuropeptides in the brain. Orexin-A is expressed mostly in the hypothalamus, and cell bodies of orexin neurons are found in the perifornical nucleus and in the dorsal and lateral hypothalamic areas. In addition of the appetite-stimulating action, orexin-A has central stimulating actions on arousal and the sympathetic nervous system. However, the relationship between the central actions of orexin-A and hypertension has not been clarified. The aim of the present study is to clarify changes of the brain concentrations of two representative neuropeptides, orexin-A and NPY, in hypertension.

Design and method: The brain tissues are obtained from 8-week-old and 16-week-old spontaneously hypertensive rats (SHR) and age-matched Wistar-Kyoto rats (WKY) as controls (n=5 per each). Peptides in brain tissues were extracted by boiling in 1 mol/L acetic acid for 10 minutes followed by homogenization and centrifugation. Orexin-A and NPY in the brain extracts were measured by radioimmunoassay.

Results: Brain concentrations of orexin-A were significantly elevated in SHR when compared with WKY (8-week-old; about 1.3-fold, p<0.05 and 16-week-old; about 1.8-fold, p<0.05). By contrast, there was no significant difference in the brain concentrations of NPY between SHR and WKY at both 8 weeks and 16-weeks.

Conclusions: The present study has shown elevated brain concentrations of orexin-A in SHR. Orexin-A has central stimulating actions on appetite, arousal and the sympathetic nervous system. The central stimulation on the sympathetic nervous system may result in hypertension. The present study has raised the possibility that orexin-A in the hypothalamus may be involved in the pathogenesis of certain types of hypertension.

PP.37.21 SALT-SENSITIVE HYPERTENSION AND CARDIOTONIC STEROIDS IN GEORGIAN POPULATION

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Objective: According to WHO, Georgia is among countries with the highest incidence of arterial hypertension. Since Georgians traditionally consume salty food, we have investigated the prevalence of salt sensitive hypertension in this population. Moreover, among factors that determine salt-sensitivity endogenous cardiotonic steroids (endogenous ouabain and marinobufagenin) have been considered. The second objective of our study was to determine the relationship between endogenous cardiotonic steroids and salt sensitivity in Georgian hypertensive patients and their family members.

Design and method: The study enrolled a total of 323 ethnically Georgians (127 males and 196 females, aged from 19 to 78 years) from 123 families. They were tested for salt-sensitivity using a high salt/low salt protocol. Anthropometry, blood pressure monitoring, and 24 hr urinary sodium excretion were performed. Initially salt-sensitivity had to be assessed by the difference of mean arterial pressure (equal or more than 3 mm Hg) on high (200 mmol/day) vs. low (40 mmol/day) salt diet, however since all subjects consumed very high salt, later we skipped high salt diet and placed subjects only on one-week low salt diet. In parallel with determination of salt-sensitivity, plasma and urine levels of marinobufagenin and ouabain were measured.

Results: Our results show that virtually all hypertensives and their family members consumed high amount of salt with a mean of 348±104 mmol/24h (>20 g daily). Salt sensitivity was detected in 84 (68%) of hypertensive subjects and in 43 family members. A high prevalence of salt-sensitive was found in women and positive correlation of salt-sensitivity with age was found. Plasma levels of marinobufagenin in salt-sensitive hypertensives almost twice exceeded those of salt-resistant subjects (0.83 ± 0.08 nmol/l in salt sensitive and 0.36 ± 0.02 nmol/l in salt resistant, p<0.05).

Conclusions: Our data confirm a very high sodium consumption by Georgian subjects which is closely linked with a high incidence of salt-sensitive hypertension. The very high salt consumption in the Georgian population may be the rational basis for intervention in order to reduce the prevalence of hypertension. Significantly increased levels of marinobufagenin might indicate its contribution to the development of salt-sensitivity.

PP.37.22 BLOOD PRESSURE AND N-TERMINAL-PRO-BRAIN NATRIURETIC PEPTIDE IN THE EMEGENCY ROOM

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Objective: To determine the influence of Blood Pressure (BP) in the measurement of NT-Pro-BNP (NT-pro-BNP) levels in patients with Hypertensive Urgency.

Design and method: The study was performed at the Emergency Department (ED) of a Second Level Hospital. The design was a prospective data collection to determine the NT-pro-BNP levels in all the patients admitted consecutively to the ED for a Hypertensive Urgency. Hypertensive Urgency defined as a Systolic Blood Pressure (SBP) above 180mmHg and/or Diastolic Blood Pressure above 110mmHg. The initial measurement of BP was in triage and subsequently each 15-30-60 minutes. Blood samples to measure the NT-pro-BNP were taken immediately after the triage. Were excluded patients with acute or chronic heart failure, acute coronary syndrome, acute stroke, aortic dissection, acute or chronic renal failure and pregnant women. All patients were discharged from the ED after appropriated reduction in BP. Data are presented as mean and Standard Desviation (SD) or 95% of Confidence Interval (CI).

Results: NT-pro-BNP levels were higher in patients with more elevated SBP levels than others with less SBP elevation.

	minimun	maximun	mean	SD
SBP	160	250	199,77	17,637
DBP	77	150	107,07	13,795
Nt-pro-BNP	17	1980	249,57	344,707

Nt-pro-BNP Prueba de Levene para la igualdad de varianzas Prueba T para la igualdad de medias

		F	Sig.	t	gl	Sig. (bilateral)
SBP	Assumed equal variances	,384	,538	-2,067	58	,043
	Not assumed equal variances			-1,976	20,180	,062
DBP	Assumed equal variances	,461	,500	,196	58	,845
	Not assumed equal variances			,224	27,429	,824

Conclusions: High levels of NT-pro-BNP are associated to high levels of Hypertensive Urgency in patients with out organ damage.

PP.37.23 ASSOCIATIONS OF CHEMERIN AND FGF21 WITH SUBCLINICAL ATHEROSCLEROSIS AND ADVERSE LIPID METABOLISM IN TYPE 2 DIABETES

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Objective: Both adipokines and hepatokines have been implicated in obesity-related disorders such as type 2 diabetes(T2DM) and atherosclerosis. Chemerin, a recently discovered adipokine, is known to function as a chemoattractant for immune cells including macrophages. Emerging evidence supports a role of chemerin in diabetes and inflammation, while the precise role in these pathophysiological states remains unclear. Fibroblast growth factor 21(FGF21) is predominantly produced in liver but also in adipose tissue and skeletal muscle in humans. FGF21 has been shown to exert beneficial effects on glucose and lipid metabolism in animal models. In humans, however, circulating FGF21 levels have been found elevated in insulin resistant states, such as obesity and T2DM, suggesting a possible compensatory elevation of FGF21. Therefore, the true role of FGF21 in insulin resistance still needs to be clarified.

Design and method: We aimed to explore the relationships of circulating chemerin and FGF21 levels to atherosclerosis and metabolic parameters in Korean T2DM subjects. Circulating chemerin, FGF21, lipid panels, and C-reactive protein levels were measured. We assessed vascular health by measuring aortic pulse-wave velocity(PWV) and carotid intima-media thickness(IMT).

Results: Chemerin was significantly related to age($r=0.18$, $P<0.05$), estimated glomerular filtration rate(GFR; $r= -0.35$, $P<0.01$), albumin-to-creatinine ratio($r=0.20$, $P<0.05$), and aortic PWV($r=0.24$, $P<0.01$). Aortic PWV was significantly correlated with age, body mass index, estimated GFR, and chemerin. Multiple regression analysis revealed that chemerin was independently associated with aortic PWV. FGF21 was significantly related to triglyceride($r=0.16$, $P<0.05$), high-density lipoprotein(HDL) cholesterol ($r= -0.21$, $P<0.01$), apolipoprotein B100($r=0.22$, $P<0.05$), and estimated GFR($r= -0.23$, $P<0.01$). However, there was no relationship of FGF21 to aortic PWV or carotid IMT. FGF21 is independently related to HDL cholesterol and apolipoprotein B100 in multiple regression analysis.

Conclusions: Circulating chemerin levels are independently related to subclinical atherosclerosis. Elevated levels of FGF21 are associated with adverse lipid profiles in T2DM patients.

PP.37.24 APELIN BLOOD LEVELS IN PATIENTS WITH ESSENTIAL HYPERTENSION AND TYPE 2 DIABETES MELLITUS IN COMBINED ANTIHYPERTENSIVE, LIPID-LOWERING AND ANTIDIABETIC THERAPY DYNAMICS

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Objective: Apelin is an endogenous peptide and functional antagonist of the renin-angiotensin system, which has antihypertensive, inotropic, antidiabetic and hypolipidemic effects and is a critical cardioprotective factor. The aim of this study was to determine the blood levels of apelin-12 in patients with essential hypertension (EH) with type 2 diabetes mellitus (T2DM) in the dynamics of combined antihypertensive, lipid-lowering and anti-diabetic therapy.

Design and method: We examined 19 patients with EH grades 2-3 with T2DM (8 men and 11 women), aged 43 to 70 years before and after 12 weeks of treatment with olmesartan (10-20 mg per day) and lercanidipine (10-20 mg per day) during therapy with atorvastatin (10-20 mg per day) and metformin (1000 mg per day). The control group consisted of 10 practically healthy people. The investigation complex included measuring levels of fasting blood glucose, lipid profile, fasting insulin with insulin resistance index calculation (HOMA index). The blood levels of apelin-12 were tested using an Enzyme-linked immunosorbent assay (ELISA).

Results: In EH patients with T2DM the significant ($p<0,05$) reduction of apelin-12 blood levels (0,866 (0,788; 0,992) ng/ml) was defined compared with healthy controls (1,087 (0,861; 1,318) ng/ml). Combination therapy in patients with EH and T2DM resulted in the achievement of target blood pressure levels and a significant decrease in blood levels of total cholesterol, LDL cholesterol, triglycerides and HOMA index. Significant increasing in blood levels of apelin-12 after treatment is found in comparison with its basal levels – 0,866 (0,788; 0,992) ng/ml vs 1,01 (0,886; 1,097), $p<0,05$.

Conclusions: The treatment with olmesartan and lercanidipine during therapy with atorvastatin and metformin in patients with EH with T2DM revealed a significant increase in apelin-12 blood levels that may be an additional factor that contributes to the achievement of target blood pressure and normalization of metabolic parameters in these patients.

PP.37.25 INCREASED CIRCULATING SERUM LEVELS OF VEGF-A ARE ASSOCIATED WITH ALBUMINURIA IN HYPERTENSIVE PATIENTS

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Objective: Vascular endothelial growth factor – A (VEGF-A) is involved nowadays in atherosclerosis. Albuminuria is considered to be one of the most important agents for the onset and progression of renal dysfunction and more recently, it has also been implicated in cardiovascular disease (CVD) and peripheral vascular disease. Recent evidence suggests that renal vascular changes contribute to progressive renal disease and that alteration of VEGF might play an important role in modulating microvascular loss of macrovascular remodeling in the kidney, as well as in the vessels. Whether VEGF is detrimental in hypertensive nephropathy or other renal conditions is not yet clearly answered. It remains controversial the mechanism by which VEGF works in the kidney, as well as in the vessels in the early stages of hypertension (HT) and chronic kidney disease (CKD). The aim of the present study was to investigate the serum levels of VEGF-A and their potential role in atherosclerosis and albuminuria in hypetensive patients.

Design and method: Hypetensive patients with macroalbuminuria (n=40) were included. As controls, there were 20 hypertensive patients without microalbuminuria (n=40) and healthy individuals (n=40). Clearance of creatinine (Clcr) and albumin excretion were examined in the 24h urine. VEGF-A levels were measured by an ELISA method. Intima media thickness of carotid and femoral arteries and atheromatic plaque were evaluated by a high resolution ultrasonography. Statistical analysis was performed with the use of a SPSS system.

Results: There was a notable difference between VEGF-A levels in each of the groups, and statistically significant evidence to support a claim of a relationship, despite the fact that the sample size was rather limited. It should be noted that patient group had the largest and highest mean level VEGF-A (646,3±130,54 pg/ml in albuminuric HT vs 246,98±160,89pg/ml in HT and 197,68±128,14 pg/ml in healthy). There was a statistically significant correlation between levels of VEGF-A and albuminuria (p<0,002). VEGF-A levels were independently correlated with IMT and atheromatic plaque (p<0,004).

Conclusions: Our study suggests that serum levels of VEGF-A might present independent risk factors of atherosclerosis and albuminuria, in hypetensive patients.

PP.37.26 APELIN AS A MARKER OF PREDIABETES IN PATIENTS WITH ESSENTIAL HYPERTENSION

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Objective: Hyperglycemia inhibits the activity of endothelial nitric oxide synthase (eNOS) reducing the production of NO and impairing endothelium-dependent vasodilatation. Apelin is an adipokine, novel marker of vascular outcomes in patients with chronic heart diseases. But data are still controversial.

Design and method: Aim: to investigate the apelins activity in patients (pts) with essential hypertension (EH) with prediabetes.
Materials and methods: 48 pts with EH were examined. Diagnosis of EH was proved according ESC/ESH (2007, 2009) recommendations. Carbohydrate disorders were estimated according levels of fasting glucose, oral glucose tolerance test (OGGT) and HbA1c data (ESH guidelines on diabetes 2007).Apelin activity was studied in blood serum using method ELISA "Phoenix" (USA). Pts were divided into 2 groups. 1st group – 21 pts with EH and without prediabetes; 2nd group 27 pts with EH and prediabetes.

Results: Results: average age of the pts was 57,47±0.62 years. Males – 20 females -27. From total amount of examined pts 52 % had carbohydrate metabolism disorders – prediabetes. Average age was not significantly different between groups. The apelin levels in both groups were significantly higher comparing to control (1st gr. – 0,39±0,05 ng/ml; 2nd gr. – 0,29±0,04 ng/ml; control – 0,13±0,00 ng/ml, p<0,05). Pts of 2nd gr. have longer anamnesis of EH that pts of 1st gr (10,45±1,25 y.; 8,67±0,79 y. p>0,05). Fasting insulin levels were significantly higher in pts of 2nd gr. – 21,72 mkOD/ml than in 1st gr. – 15,10 ±0,98 mkOD/ml , p<0,05. PostOGTT insulin levels were also significantly higher in pts with prediabetes comparing to pts with EH without prediabetes and control gr. (43,71±2,31; 68,92±2,98; 13,78±0,39 mkOD/ml correspondently, p<0,05). In pts of 1 gr apelin correlates with HbA1c R=0,52 (p<0,05). In pts of 2 gr apelin correlates with body mass index – R=0,53 (p<0,05); postprandial glucose - R=0,77 (p<0,05); postprandial insuline - R=0,66 (p<0,05).

Conclusions: Conclusion: in patients with essential hypertension and prediabetes apelin levels are increased comparing to control group, but the same time lower than in patients with essential hypertension without prediabetes that could be connected with chronic inflammation state.

PP.37.27 COPEPTIN, HEMODIALYSIS AND BLOOD PRESSURE

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Objective: Arginine Vasopressin (AVP) is a key regulator of water balance. Assay of copeptin, known as the AVP associated glycopeptide, has been shown as a useful alternative to direct measurement of AVP concentration. Many patients on regular dialysis treatment have chronic fluid overload, extracellular volume expansion and congestive cardiomyopathy. An exaggerated ingestion of fluids, due to a dipsogenic stimulus, may be an aggravating factor. The rapid removal of excess fluid by hemodialysis may expose these patients to severe dialysis intolerance and to dangerous fluctuations in blood pressure (BP).

Design and method: We studied 16 patients (9 men, 7 women), with a mean age of 66 (range 30-87), on regular dialysis treatment. The study was performed after the long interdialytic period in the morning and in the fasting state. Patients have been weighed, BP was measured and blood collected for humoral determinations. Afterwards they underwent a four hours hemodialysis. Measurements were repeated at the end of the session. Copeptin was measured with a commercial sandwich immunoluminometric assay (BRAHMS AG, Hennigsdorf, Germany).

Results: Hemodialysis caused a significant (p<0,01) decrease in body weight from 70± 4 to 67±4 kg. Systolic BP, regularly checked during dialysis, was reduced (p<0,01) from 145±4 to 121±6 mmHg after dialysis. A very high plasma osmolality was found in these subjects in the interdialytic period, 309±2 mOsm/Kg. After the dialytic procedure osmolality was lowered (p<0,01) although it remained above normal values, to 297±2. Copeptin concentration in such a hyperosmolar state has been found elevated with an interdialytic value of 175±18 pmol/L, which was reduced (p=0,03) to 146±22 pmol/L by dialysis.

Conclusions: We conclude that in patients on regular dialysis treatment, an aggravating factor of their cardiovascular situation, characterized by fluid overload and disturbance in BP regulation, is due to the exaggerated elevation of the principal hormone responsible of water regulation, which in the present study is represented by the C-terminal part of AVP prohormone, copeptin. Disturbance of osmoregulation and reduced renal catabolism may explain such an elevation. A more analytical study may help to predict the individual risk of cardiovascular complications in patients on hemodialysis.

PP.37.28 HYPERTENSION AND VASCULAR REMODELING: BENEFICIAL EFFECTS OF CHRONIC TREATMENT WITH C-TYPE NATRIURETIC PEPTIDE

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Objective: C-type natriuretic peptide (CNP) and nitric oxide (NO) have effects on endothelium and vascular smooth muscle and are involved in the regulation of blood pressure and cardiovascular homeostasis. In previous studies, we showed that acute infusion of CNP induces an increase in the activity of endothelial NO synthase (NOS) in both normotensive and spontaneously hypertensive rats (SHR). The aim was to evaluate the effects of chronic administration of CNP on NO system and vascular morphology in SHR.

Design and method: Male normotensive Wistar rats (W) and SHR, 12 weeks old, were infused with CNP (0.75µg/hour/rat) or saline (NaCl 0.9% w/v) by subcutaneous osmotic pupms (Alzet) for 14 days: W-NaCl, W-CNP, SHR-NaCl and SHR-CNP. After treatment, systolic blood pressure (SBP, mmHg) was measured by tail-cuff method. Subsequently the animals were sacrificed by decapitation and the aorta was removed to determine NOS activity (pmol/[U14C]L-citrulline/g tissue.min) using [U14C]L-arginine as a substrate. Also, in aorta sections stained with hematoxylin-eosin we evaluated the media thickness (µm) and the relation of media to lumen diameter (µm/µm), also elastin density (number of fibers/media thickness, µm-1)

was evaluated by Verhoeff-Van Gieson's stain, signs of vascular fibrosis by Picrosirius red (stained area/total area) and the expression of TGF-β, IL-6 and TNF-α by immunohistochemistry (stained area/total area, %). Statistical analysis: two-way ANOVA, Bonferroni post-test; results are expressed as mean±SEM, n=6 rats/group.

Results: The table shows that CNP decreases SBP in SHR, and increases NOS activity in both W and SHR, however this increase was lower in hypertensive animals (δW[CNP-NaCl] = 104±6; δSHR[CNP-NaCl] = 84±5*, *p<0.01 vs δW).

	W-NaCl	W-CNP	SHR-NaCl	SHR-CNP
SBP	121±3	120±5	178±3*	159±5^
NOS	85±6	189±2*	125±8*	209±5^
Media	66.8±9.0	68.3±2.1	104.9±10.2*	76.2±4.0^
Media/Lumen	0.035±0.009	0.037±0.006	0.068±0.011*	0.043±0.007^
Elastin density	0.12±0.02	0.15±0.01	0.07±0.01*	0.12±0.01^
Picrosirius red	0.10±0.04	0.08±0.02	0.34±0.01*	0.19±0.03^
TGF-β	1.82±0.64	1.56±0.47	6.07±1.52*	2.51±0.44^
IL-6	0.7±0.4	0.5±0.3	19.2±0.8*	3.4±0.6^
TNF-α	1.4±0.3	0.9±0.4	18.5±0.9*	4.4±0.7^

*p<0.01 vs W-NaCl; ^p<0.01 vs SHR-NaCl.

Conclusions: CNP chronic treatment decreases systolic blood pressure, increases the activity of NO system in the aorta and induces changes on vascular remodeling in SHR, decreasing the thickness of the intermediate layer, increasing the density of elastin and reducing signs of fibrosis and markers of inflammation, which may be beneficial in this model of hypertension.

PP.37.29 CHRONIC TREATMENT WITH C-TYPE NATRIURETIC PEPTIDE SHOWS BENEFICIAL EFFECTS ON CARDIAC TISSUE AND ITS FUNCTION IN SPONTANEOUSLY HYPERTENSIVE RATS

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Objective: C-type natriuretic peptide (CNP) is synthetized in cardiac tissue. It is known to regulate cardiovascular homeostasis though its effects on endothelial cells, fibroblasts and cardiac myocytes. Due to its antihypertensive and cardioprotective action, it may be considered in the treatment of several cardiac pathologies. The aim of our work was to evaluate the effects of CNP chronic treatment on cardiac hypertrophy and its function and the study of interstitial fibrosis, the inflammatory state, oxidative stress and nitric oxide (NO) cardiac system in spontaneously hypertensive rats (SHR) and Wistar normotensive ones (W).

Design and method: 12-week-old male SHR and W were infused through osmotic pumps with CNP (0, 75 µg/hr) or saline (S) for 14 days. Systolic blood pressure (SBP, mmHg) was recorded by tail-cuff method and the function of the left ventricle (LV) determined by echocardiogram (heart rate (HR bpm), end diastolic and systolic volume (EDV, ESV ml), systolic volume (SV ml) and cardiac output (CO in ml/min)). Finalizing the treatment, animals were decapitated and the LV was extracted to study several morphometric parameters, such as the LV mass index (LVMI g LV/mm tibial longitude) and the myocyte area (µm2) through Hematoxylin-Eosin-stain, and fibrosis and inflammatory state in tissue slices through Picrosirius-Red-stain and IL-6 and TNFα immunohistochemistry (percentage of staining per mm2) respectively. Antioxidant glutathione peroxidase (Gpx, µmol/min mg protein) and catalase (pmol/mg protein) enzymes activity were measured by spectrophotometric techniques. To evaluate the NO system, NO synthase (NOS) activity was determined through consumption of its radioactive substrate (pmol 14C L-citrulline/g.tissue. min) and the expression of its endothelial isoform (eNOS) quantified by Western Blot. Statistics: Two way ANOVA, Bonferroni post-test.

Results:

	W-S	W-CNP	SHR-S	SHR-CNP
SBP	118±2	122±3	175±3*	159±5#
LVMI	0,023±0,002	0,024±0,001	0,032±0,001*	0,029±0,001
Myocyte area	348,9±11,0	337,4±10,1	609,1±39,4*	556,6±61,5
HR	427±15	440±10	435±10	434±15
ESV	0,05±0,01	0,04±0,01	0,05±0,02	0,07±0,03
EDV	0,21±0,03	0,22±0,04	0,16±0,02*	0,23±0,03#
SV	0,17±0,02	0,18±0,03	0,11±0,01*	0,16±0,02#
CO	80,80±8,00	82,40±10,32	47,85±2,01*	68,80±7,35#
% Fibrosis	1,54±0,53	1,78±0,17	6,81±0,40*	3,27±0,67#
NOS activity	197,7±5,8	344,6±7,9*	262,0±3,5*	361,7±3,6#
eNOS expression	1,00±0,13	1,11±0,13	1,02±0,08	1,05±0,18
Catalase	0,076±0,004	0,071±0,003	0,114±0,003*	0,105±0,002
Gpx	89,9±2,5	73,8±4,1	152,1±15,8*	141,2±6,8
IL-6	1,8 ± 1,0	1,3 ± 0,6	19,4 ± 2,7*	2,1 ± 0,7#
TNFα	1,1 ± 0,7	1,0 ± 0,5	15,7 ± 3,4*	1,5 ± 0,9#

*p<0.01 vs W-S; #p<0,01 vs SHR-S. Results are expressed as media±SEM, n=6 rats/group.

Conclusions: Characteristic high SBP values in SHR are accompanied by hypertrophy, functional alterations, fibrosis, an upregulation of antioxidant systems and a higher presence of inflammatory cytokines. Although no morphometric parameters have changed, chronic treatment with CNP improves LV function and lowers fibrosis and pro-inflammatory markers in cardiac tissue as it increases NOS activity in SHR. Altogether, these beneficial effects could be causing the drop in SBP we observe in this model of hypertension.

POSTERS' SESSION

POSTERS' SESSION PS38
DIAGNOSTIC ASPECTS - EDUCATIONAL PROGRAMMES

PP.38.01 ALDOSTERONE-RENIN RATIO IN PATIENTS WITH UNCONTROLLED HYPERTENSION: CHALLENGES OF INTERPRETATION

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Objective: Aldosterone-renin ratio (ARR) is a preferred screening test for primary aldosteronism (PA) and showed to be suitable even in patients on most anti-hypertensive agents. On the other hand subgroups of patients with high risk of this disease (i.e. resistant hypertension, obstructive sleep apnea) are associated with aldosterone excess, resulting sometimes in false-positive ARR, and actually the confirmation of the PA in patients with positive ARR test rarely exceeds 30%. The aim of the present study was to assess the utility of ARR and its components for detection of PA in routine practice of specialized hypertension excellence center.

Design and method: We examined 314 consecutive patients with uncontrolled hypertension [161 males (51.3%) and 153 females (48.7%), mean age 45,6±16,6 years] referred to Federal Almazov Medical Research Centre (HNT Excellence Center of ESH). Plasma aldosterone and renin concentrations with calculation of ARR were measured after correction for hypokalemia and obligatory after withdrawal of diuretics and aldosterone antagonists. Saline infusion test was used for confirmation of the PA.

Results: Increased ARR was found in 141 (52.2%) patients with uncontrolled hypertension (n=314), which may be explained by a specific population referred to hypertension clinic - high proportion of severe and resistant hypertension, obesity, obstructive sleep apnea (63.1%). In a group of patients with high ARR (n = 141) concurrently increased aldosterone level was observed in 90 (63.8%) patients and in most cases renin was lower (68.1%) or within normal values. In 51 (36.2 %) patients ARR was increased due to the low renin concentration without aldosterone excess, most of them were older, with mild hypertension and on beta-blockers. The PA was confirmed in 27 patients (8.6% of all patients of hypertension, 19.2 % of patients with elevated ARR), all of them were characterized by long-term moderate-to-severe hypertension or resistance to antihypertensive treatment.

Conclusions: The diagnosis of PA was confirmed only in 19.2% of patients with elevated ARR, in other cases false-positive results could be explained by low renin levels without aldosterone excess or secondary aldosteronism. This indicates importance of evaluation of ARR in combination with aldosterone and renin concentrations.

PP.38.02 COMPARISON OF SERUM AND PLASMA METABOLIC FEATURES UNDER THE INFLUENCE OF PHARMACOTHERAPY OF PRIMARY HYPERTENSION COMBINED WITH CORONARY HEART DISEASE IN ELDERLY PATIENTS

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Objective: To reveal types of serum and plasma metabolic transformations during treatment of elderly patients with primary hypertension (PH) combined with coronary heart disease (CHD) for improvement pharmacotherapy (PT) efficacy.

Design and method: 60 patients with above mentioned states were examined and treated according to clinical recommendations. Average age (M±m) was 69.3±2.5 years, among them males - 27 (average age 67.2±3.8), females - 33 (average age 70.4±3.1). The patients received combined pharmacotherapy: ramipril+ bisoprolol+indapamide+aspirin. Laser correlation spectroscopy (LCS) was special research method. Blood serum and plasma were an investigated biomaterial. Blood sampling was carried out prior to treatment and for the 14th day of PT.

Results: Hydrolytic reactions prevail in plasma in comparison with serum both before (71.4% vs 57.1%) and after treatment (47.6% vs 23.8%). The expression of hydrolytic alterations decreased after the course of PT at the expense of the toxic changes (28.6% vs 9.5%) in serum and catabolic ones in plasma (19% vs 4.8%). In plasma toxic-like alterations remained the same as before treatment (28.6%). Synthetic-directed processes were dominating in serum (42.9% vs 14.3%) due to prevalence of allergy-like (23.8% vs 14.3%) and autoimmune (19% vs 0%) changes. Subfractional structure of serum and plasma was almost identical before PT – dominance of II discrete dynamic zone particles (DDZP). After the treatment more expressed decreasing of the I and II DDZP was observed in serum. Also in serum was identified considerable leap of V DDZP (4.1% vs 24.2%), simultaneously in plasma a significant increasing of IV DDZP (14.8% vs 26.8%) was observed.

Conclusions: Before the treatment metabolic features of investigated liquids are almost equal with the prevalence of hydrolytic alterations. But after PT predominance of autoimmune processes with depression of toxic ones are observed in serum and increasing of allergy-like alterations with inhibition of catabolic ones are revealed in plasma. The common feature in both liquids is activation of synthetic-directed alterations and depression of hydrolytic ones. LCS is equally significant method for estimation of PT efficacy by studying both serum and plasma.

PP.38.03 TROPONIN T CONCENTRATION IN PATIENTS WITH UNSTABLE ANGINA AND ATTENDANT SUBCLINICAL HYPOTHYROIDISM

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Objective: Subclinical hypothyroidism (SH) is a strong predictor of risk for atherosclerosis and myocardial infarction in eldery woman, it is associated with a moderately elevated risk of heart failure events and increased risk for cardiovascular mortality among older adults.
Purpose: to assess the role of SH in ischemic damage of myocardium in acute coronary syndrome without ST-segment elevation.

Design and method: The study includes 24 patients (F/M: 20/4, mean age 60,4±3,2 years) with acute coronary syndrome without ST-segment elevation (unstable angina) and SH diagnosed by registration of elevated TSH levels (>4,2 mU/l) and normal levels of FT3 and FT4, and 22 patients (F/M: 19/3, mean age 61,1±3,4 years) with acute coronary syndrome without ST-segment elevation (unstable angina) with normal thyroid function. All patients and the control group (n=19; F/M: 15/4; mean age 60,1±3,2 years) were determined the concentration of cardiac troponin T (cTnT) on the third morning after onset of symptoms, underwent standard echocardiography and Doppler imaging.

Results: Patients with unstable angina and attendant SH showed significantly higher level of cTnT (0,8±0,2 against 0,5±0,1 mkg/l, P<0,05) than patients with normal thyroid function. A significant but inverse and weaker correlation was obtained between cTnT level and left ventricular ejection fraction (r= -0,61, P<0,001).

Conclusions: Patients with acute coronary syndrome without ST-segment elevation (unstable angina) and subclinical hypothyroidism show more expressed manifestation of ischemic damage indices that can serve an additional risk factor for development of myocardial infarction and cardiac complications.

PP.38.04 BIOMARKERS OF CARDIOMYOCYTE INJURY AND STRESS IDENTIFY LEFT ATRIAL AND LEFT VENTRICULAR REMODELLING AND DYSFUNCTION: A POPULATION-BASED STUDY

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Objective: The validation of effective screening tools for the identification of patients at the early stage of left ventricular (LV) remodelling is a major clinical need. Thus, we explored the association of subclinical cardiac remodelling and dysfunction with circulating biomarkers of cardiomyocyte injury and stress and their interactions with biomarkers reflecting collagen turnover.

Design and method: We randomly recruited 727 subjects from a general population (51.2% women; mean age 51.3 years). Measurements included echocardiographic left atrial and LV structure and function, quantification of cardiac Troponine C by high sensitivity assay (hs-cTnT), NT-proBNP, and biomarkers of collagen type I and III turnover.

Results: In unadjusted and adjusted analyses, the prevalence of left atrial enlargement (LAE), LV hypertrophy (LVH) and LV diastolic dysfunction (LVDD) increased with higher hs-cTnT (P<0.05). NT-proBNP was independently of other covariables associated with LVDD (P=0.008). Net reclassification improvement was 28.5% for LAE, 32.7% for LVH and 27.2% for LVDD (P for all <=0.0017) with the addition of both biomarkers to conventional risk factors. Furthermore, both hs-cTnT and NT-proBNP were independently and positively associated with the carboxyterminal telopeptide of type I collagen and with the tissue inhibitor of the matrix metalloproteinase type 1. In a sensitivity analysis, after exclusion of participants with previous cardiac diseases, our findings remained consistent.

Conclusions: Our population-based study suggested that hs-cTnT was independently associated with LV and LA remodelling, and that, in combination with NT-proBNP, hs-cTnT shows incremental diagnostic value over the conventional risk factors. Both biomarkers are associated with biomarkers of collagen type 1 turnover. Thus, biomarkers of cardiomyocyte microinjury and hemodynamic stress, and of collagen metabolism, are potentially useful tools to explore the pathophysiology of cardiac remodelling in the general population.

PP.38.05 HYPERHOMOCYSTEINEMIA, LIPIDS AND LIPOPROTEIN DISTURBANCES IN PATIENTS WITH PRIMARY HYPERTENSION

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Objective: Hiperhomocysteinemia is a new risk factors of problematic classification. Its influence on blood vessels is still unknown and requires further investigation. Not every patient with chronic heart disease presents classic risk factors. That is why the assessment of the level of homocysteine may be helpful in the prediction of heart failure.A positive correlation between concentration of homocysteine in blood serum, lipids and lipoproteins was observed. Among patients with primary hypertension, the coexistence of several risk factors might cause endothelium damage, accelerates the development of atherosclerosis and leads to ischemic heart disease and strokes
Tha main aim of the study was:
What are the concentrations of total cholesterol, LDL-cholesterol, HDL-cholesterol, triglycerides, apo A-I (apolipoprotein A-I), apo B (apolipoprotein B) and Lp(a) (lipoprotein(a)) in serum of patients with primary hypertension and with hiperhomocysteinemia?
2. Is there any correlation between the concentration of homocysteine in blood serum and total cholesterol, LDL-cholesterol, HDL-cholesterol, triglycerides, apo A-I, apo B and Lp(a) in patients with primary hypertension?

Design and method: 42 patients with primary hypertension, aged 22 to 57, were investigated. The control group consisted of 20 healthy volunteers.
The concentration of homocysteine in blood serum was evaluated using immunochemical method (FPIA – Fluorescence Polarization Immunoassay). The concentration of total cholesterol, LDL-cholesterol, HDL-cholesterol and triglycerides in blood serum were estimated using enzymatic method. Apo A-I, apo B and lipoprotein(a) were assessed using nephelometric method.

Results: The analysis of the results revealed statistically significant lower concentrations of HDL-cholesterol and apo A-I in blood serum of patients with primary hypertension and hiperhomocysteinemia than in the population with hypertension and normohomocysteinemia. Negative correlation between homocysteine and HDL-cholesterol as well as apoA–I has been revealed.

Conclusions: Quantitative analysis of the concentration of lipids and lipoproteins in blood serum in patients with primary hypertension and hiperhomocysteinemia may suggest that this type of human population might be more susceptible to atherosclerosis than those with primary hypertension and normal values of homocysteine.

PP.38.06 DOES THE 'PULSE TIME INDEX OF NORM (PTIN)' PROVIDE ADDITIONAL INFORMATION ABOUT CARDIOVASCULAR RISK?

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Objective: The pulse wave velocity (PWV) measurement is a method of assessing arterial stiffness and is important in the evaluation of cardiovascular risk. Cuff-based methods such as Vasotens® derive PWV values from oscillometric measurements of the brachial artery waveform. System for PWV measurements is integrated into ambulatory blood pressure monitoring system which provides not only one PWV measurement but also several PWV measurements over a period of 24 hours. This new 24-h pulse wave analysis led to the development of a new calculation, 'Pulse Time Index of Norm (PTIN)'. The PTIN is defined as the percentage of a period during which the PWV does not exceed 10 m/s.

Design and method: Oscillometrically generated waveform files (n=510, measurements ranging from a single point to 72 hours), which were previously used for Vasotens® validation and clinical research studies, were re-analysed using the new 2013 software version of the Vasotens® technology program, which enables PTIN calculation.

Results: The cut-off point at 10 m/s in the ROC curve showed a sensitivity of 93.3% and a specificity of 81.5% for single measurements of PWV compared to SphygmoCor®.
The left-sided reference interval of PTIN was equal to 83.2% (lower limit). During the entirety of the 'asleep' period in young women, the PWV did not exceed 10 m/s, i.e., PTIN of 100%. The minimum per cent of normal PWV was observed in 50- to 64-year-old men during the 'awake' period, i.e., PTIN of 73.4%.
Reliability statistics showed ICC 0.96 for the PTIN day-to-day repeatability.
Good correlation (r=-0.72) between PTIN and left ventricular mass index was shown. There was high significance level (Yates corrected χ^2=34.2, p<0.001) in 2 by 2 table for 'awake' and 'asleep' periods in subgroups of patients with and without LVH.

Conclusions: Performing multiple PWV measurements over time and especially during nighttime is more insightful than performing only a single PWV measurement. Calculating PTIN is clinically feasible and seems to enhance the target organ damage detecting.

PP.38.07 A NEW CALCULATION, 'PULSE TIME INDEX OF NORM (PTIN)' AND ITS DAY-TO-DAY REPEATABILITY

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Objective: The pulse wave velocity (PWV) measurement is a method of assessing arterial stiffness and is important in the evaluation of cardiovascular risk. Some systems for PWV measurements are integrated into ABPM systems that not only provide one PWV measurement but also several PWV measurements over a period of 24 to 72 hours. This new 24-h pulse wave analysis led to the development of a new calculation, 'Pulse Time Index of Norm (PTIN)', that is provided by the Vasotens® technology. The aim of the present study is to test the new PTIN for clinical feasibility by using day-to-day repeatability retrospective analysis.

Design and method: Overall, 85 oscillometrically generated waveform files that had previously been used in ABPM studies lasting more than 2 days (>48 hours) were re-analyzed using the new 2013 software version of Vasotens® technology program. The new Vasotens® software version differs from the old version because the new version has the automatic PTIN calculation. The PTIN is defined as the percentage of a period ('24-h', 'wake', or 'sleep') during which the PWV does not exceed 10 m/s.

Results: Approximately 90% of the monitoring period in normotensive patients and 60 % of the monitoring period in hypertensive patients are periods with

normal PWV. The PTIN intraclass correlation coefficients of the first and second '24-h', 'wake' and 'sleep' periods in normotensive and hypertensive patients were ranged from 0.91 to 0.99.

Conclusions: The main result of this present study is the excellent day-to-day repeatability, which is important because the conclusions regarding the significant alterations of the aortic function and the inclusion of a patient in a particular risk group is crucially dependent on the accuracy of the PWV measurement. Performing multiple PWV measurements over time for a given patient would be more insightful than performing only a single PWV measurement.
Thus, the PTIN assessment with the Vasotens technology appears to be feasible for clinical practice.

PP.38.08 THE 24-H PULSE WAVE VELOCITY, AORTIC BLOOD PRESSURE AND AUGMENTATION INDEX IN NORMOTENSIVES: FIRST RESULTS OF THE BPLAB-VASOTENS REGISTRY

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Objective: The purpose of this study is to examine the pulse wave velocity (PWV), pulse time index of norm (PTIN), aortic augmentation index corrected for heart rate 75 (AIx@75) and central systolic and diastolic blood pressure (SADao and DADao, respectively) during 24-hour monitoring in normotensive volunteers.

Design and method: Overall, 467 Caucasian subjects (206 men and 261 women) were recruited in this study. Participants were excluded from the study if they were less than 19 years of age, had blood test abnormalities, had a body mass index greater than 27.5 kg/m2, had impaired glucose tolerance or had hypotension or hypertension. ABPM with the BPLab® device was performed in each subject. ABPM waveforms were analysed using the special automatic Vasotens® algorithm, which allows the calculation of PWV, PTIN, Aix@75, SADao, DADao for '24 - h', 'awake' and 'asleep' periods.

Results: The main result of is the establishment of normal and reference values for indices: PWV, PTIN, central BP and Aix@75 in '24 - h', 'awake' and 'asleep' periods. These values are based on a dataset obtained from four centres distributed across Russia. Nocturnal pattern and gender differences in these indices were identified.

Conclusions: Pending further validation in prospective outcome-based studies, our data may be used as preliminary diagnostic values for the BPLab ABPM additional index in adult Caucasian subjects.

PP.38.09 DIAGNOSTIC VALUE OF NON-HEME IRON IN HYPERTENSIVES WITH CARDIO-RENAL-ANEMIA SYNDROME

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Objective: Improving the quality of diagnostic anemia by studying the state of non-heme iron in hypertensives with different stages of chronic kidney disease (CKD).

Design and method: The study included 79 hypertensives (28 – men, 51 – women; aged 33-72) with CKD II-V stages. Patients (pts) were divided into two groups: 24 pts without anemia (group I) and 55 pts with anemia (group II). Group II was divided into 3 subgroups according to the anemia severity: 31 pts – mild degree (subgroup 1); 18 pts - moderate degree (subgroup 2); 6 pts - severe anemia (subgroup 3). The control group consisted 20 healthy people. Hematology, urine tests, glomerular filtration rate, ultrasound of the kidneys, ABPM, plasma urea and creatinine levels, serum iron, transferrin and ferritin levels were measured.

Results: BP range was 145/90±10/7 mm Hg. Patients have different CKD stages: II in 24 (30.4%); III - 29 (36.7%); IV - 9 (11.4%); V - 17 (21.5%) cases. In all pts ultrasound structural changes in the parenchyma or in the calyx-pelvis complex were revealed. All pts had increased plasma urea and creatinine levels, reduced glomerular filtration rate, decreased hemoglobin and hematocrit levels more pronounced in pts with severe anemia. Serum iron levels were reduced on 21.7% (group I) and by 2 times (group II) vs. 22.36±6.84 mmol/L in the control group ($p<0.05$). Ferritin levels tended to decrease in all groups and were reduced on 28.7% (group I); by 1.6 times (subgroup 1); 2.1 times (subgroup 2); 2.5 times (subgroup 3) vs. 147.35±38.84 mcg/L in the control group ($p<0.05$). Transferrin levels were decreased on 18% (group I); 26.7% (subgroup 1); 28.3% (subgroup 2); 51.7% (subgroup 3) vs. 3.11±0.14 g/L in the control group ($p<0.05$).

Conclusions: For the diagnosis of anemia and its severity degree it should be considered not only hemoglobin levels but indicators of non-heme iron status in hypertensives with cardio-renal-anemia syndrome. Intensity reduction of plasma iron, transferrin and ferritin levels determines on the anemia severity in these pts. Their lowest levels are characteristic for pts with CKD IV-V stages and with severe anemia.

PP.38.10 FACTORS AFFECTING THE DAILY PARAMETERS OF CENTRAL AORTIC PRESSURE AND RIGIDITY IN NORMOTENSIVE SUBJECTS ACCORDING TO THE AMBULATORY MONITORING

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Objective: To establish the correlations of daily central aortic pressure with age, anthropometric data (height, weight, body mass index (BMI), waist circumference (WC), hip circumference (HC), the ratio of WC/HC), glucose and cholesterol fractions (TC) in normotensive individuals.

Design and method: The study included 90 healthy subjects (29 men and 61 women) without any clinical signs of acute or chronic diseases. Inclusion criteria were the level of office BP below 140/90 mmHg, heart rate 60-80 beats/min, the lack of systematic/regular medication. Mean age was 48 (33; 58) years, SBP – 117,7 (110,2; 123,3) mmHg, DPB - 73,4±6,1 mmHg, heart rate - 73,1±7,3 min. Mean daily values of the central and peripheral hemodynamics assessed by ambulatory blood pressure monitoring device BpLab with vascular stiffness analysis program Vasotens (Peter TELEGIN, Russia). Parameters of central aortic pressure (SBPao, PPao, Aixao) were determined.

Results: There was a significant relationship between age and average daily values of SBPao ($r = 0,25$; $p <0,05$) and Aixao ($r = 0,62$; $p <0.01$), and between height and Aixao ($r = - 0,58$; $p <0,01$). BMI correlated with SBPao level ($r = 0,42$; $p < 0,01$), and PPao ($r = 0,40$; $p <0,01$). There is a significant direct relationship between weight and SBPao ($r = 0,38$; $p <0,01$), PPao ($r = 0,39$; $p< 0,01$) inverse relationship - between weight and Aixao ($r = - 0.27$; $p < 0,05$). Moreover, the PPao correlated with WC ($r = 0,35$; $p<0,05$) and the mean level of SBPao - not only with WC ($r = 0,51$; $p < 0.01$), but also with HC ($r = 0,30$; $p <0,05$), the ratio of WC/HC ($r = 0,44$; $p <0,01$). Among the indices of central aortic pulse wave values the PPao significantly correlated with venous plasma fasting glucose ($r = 0,60$; $p < 0,05$) and triglycerides - with SBPao ($r = 0,61$; $p < 0.05$). Relationship of aortic stiffness with other cholesterol fractions did not achieve statistical significance.

Conclusions: Central aortic pressure characteristics in normotensive subjects correlated with age, anthropometric characteristics, as well as with blood glucose and triglycerides.

PP.38.11 DEPENDENCE THE HEART RATE FREQUENCY CHARACTERISTICS OF THE AGE AMONG THE HEALTHY INDIVIDUALS ACCORDING HOLTER ECG MONITORING

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Objective: To examine the relationship of heart rate (HR) frequency characteristics according to daily monitoring of ECG and age of the patients in group of healthy individuals.

Design and method: 84 healthy volunteers of both sexes (75 (53%) men and 67 (47%) women) aged 19 to 69 years (mean age 48,5 (31; 53) years) were examined. The ECG monitoring with an estimate of the frequency characteristics of sinus rhythm was performed using the Holter monitoring Astrokard. Additional option calculates the percentage of HR exceeding input thresholds, which was designated as chronotropic load (CL), and normalized area index trend in HR (NAI). An analysis of the 24-hour record was recorded following frequency rates of sinus rhythm: maximum, minimum and mean HR per day, the mean HR for the day and night, CL and NAI during a day, in the daytime and nighttime.

Results: All patients in the study were randomized by age into 5 groups: the first group - 31 patients (19 to 29 years), the second group - 30 people (30 to 39 years), the third - 28 people (40 to 49 years), 4th - 33 people (50 to 59 years) and the fifth - 20 people over 60 years old. In the first group a correlation with age was revealed: CL night ($r=-0,65$, $p<0,05$), CL day ($r=-0,67$, $p<0,05$), NAI night ($r=-0,71$, $p<0,01$), NAI day ($r=-0,69$, $p<0,01$), NAI night ($r=-0,54$, $p<0,05$) and with the average age of the HR per daytime ($r=-0,80$, $p<0,001$), and the aver-

age daily HR (r=-0,79, p<0,001). Negative correlation was observed in fourth group: CL night (r=-0,47, p<0,05), CL day (r=-0,41, p<0,05), CL night (r=0,44, p<0,05), NAI night (r=-0,58, p<0,001), NAI day (r=-0,53, p<0,05), NAI night (r=-0,40, p<0,05), the average 24-hours HR (r=-0,41, p<0,05) and average daytime HR (r=-0,40, p<0,05). Among all investigated the correlation with age was found with one parameter - average HR for 24-hours (r=-0,25, p<0,05).

Conclusions: in healthy subjects from 19 to 29 and from 50 to 59 years there is significant negative relationship between the most of the frequency characteristics of HR and the age.

PP.38.12 EVALUATION OF CHEST RADIOGRAPHY IN PATIENTS WITH HYPERTENSION IN AN ANESTHESIA CONSULTATION

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Objective: Evaluation of organic damage in hypertensive patients provides important information regarding the severity of hypertension and cardiovascular risk. The markers most commonly used are left ventricular hypertrophy (LVH) determined by electrocardiogram (EKG) or echocardiography, microalbuminuria, mild elevation of serum creatinine, hypertensive retinopathy and thickening of the carotid intima-media.

Design and method: Retrospective descriptive study of the clinical history of patients with hypertension, who attended the outpatient clinic of Anesthesiology HUA Santiago Apostle of Vitoria Alava (Spain). All patients had a diagnosis of primary hypertension established at least five years prior to review of your medical history and some of them had a history of ischemic heart disease, rheumatic or congenital documented in the clinical record. radiology
Each patient was taken postero-anterior and lateral chest radiograph following established technique. If you have already received one, to be considered, it must have a time not exceeding one year.
Echocardiogram: 20 patients had recent transthoracic echocardiogram.

Results: In total there were 100 hypertensive patients. 64 men and 36 women.

Years	Man	Woman	chest x-ray normal	chest x-ray abnormal	echocardiography
40-49	2	0	2		
50-59	6	4	9	1 AORTIC ELONGATION	3 LVH
60-69	21	8	25	3 AORTIC ELONGATION 1 IN THE LIMIT	1 VID 1LVH 1 NORMAL
70-79	26	15	38	1CARDIOMEGALY+AORTIC ELONGATION 2 AORTIC ELONGATION	3 normal 8LVH LIGHT
80-89	9	9	11	5 CARDIOMEGALY 2 AORTIC ELONGATION	2 LVH LIGHT 2 normal
>90	0	0			

Conclusions: Although chest radiography is an affordable and routine examination in many diseases, it is not considered an essential examination in the initial assessment of the hypertensive.

PP.38.13 MIR-1, MIR-9 AND MIR-126 LEVELS IN PERIPHERAL BLOOD MONONUCLEAR CELLS IN PATIENTS WITH ESSENTIAL HYPERTENSION

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Objective: To assess the expression levels of microRNAs (miRs) implicated in cardiovascular function or disease and possibly playing a role in hypertension in peripheral blood mononuclear cells of patients with essential hypertension and their relationship to target organ damage. Ambulatory blood pressure monitoring (ABPM) is a good predictor of target organ damage in hypertensive patients. We selected to asses the expression levels of miR-1, miR-9 and miR-126.

Design and method: 24-hour ABPM, echocardiography and blood sampling were performed in 60 untreated participants with essential hypertension. Blood samples from 29 healthy individuals were included for comparison. Peripheral blood mononuclear cells (PBMCs) were isolated and microRNA levels were determined by quantitative real-time reverse transcription PCR.

Results: miR-1 (33.94±5.19 versus 12.35±2.13 p=0.006) showed higher levels in hypertensive patients compare to control individuals while miR-9 (6.30±1.10 versus 44.62±15.30, p=0.001) and miR-126 (3.33±0.37 versus 8.15±2.34, p=0.006) showed lower levels in hypertensive patients compare to controls. In hypertensive patients, miR-1 levels showed a significant negative correlation (r=-0.312, p=0.015) with the mean 24-hour dipping status. Significant positive correlations of miR-9 (r=0.300, p=0.021) and miR-126 (r=0.350, p=0.007) levels with 24-hour pulse pressure were observed.

Conclusions: miR-1, miR-9 and miR-126 levels show alterations in PBMCs of hypertensive patients compare to healthy controls and correlate significantly with 24-hour ABPM parameters predicting target organ damage in hypertensive patients.

PP.38.14 EVALUATION OF NON-SPECIFIC RESISTANCE IN THE OFFSPRING OF PEOPLE EXPOSED TO RADIATION BASED ON THE STUDY OF VEGETATIVE REGULATION OF CARDIAC ACTIVITY

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Objective: The study of non-specific resistance in the offspring of Kazakhstan residents exposed to radiation based on the study of vegetative regulation of cardiac activity.

Design and method: We have conducted analysis of heart rate variability in the offspring of people exposed to radiation in the result of nuclear tests on Semipalatinsk Teat Site (radiation doses >250 mSv). The main study group included 189 people born after 1963 from exposed parents; geographically and age matched control was represented by 172 non-exposed residents which arrived on these territories after cessation of nuclear testing in 1990.

Results: In the studied group it was registered significant exceeding of the rates standard deviation of NN intervals (SDNN, ms) in comparison with control rates (36.2; 44.6 ms, respectively; p<0.05; 0.05). It shows decreasing of effectiveness of vegetative regulation of circulation in the main study group. Rates of parasympathetic regulation (root mean square of successive differences (RMSSD), ms) were increased in the main study group versus control rates (43.8; 42.4; 39.2 ms, respectively; p<0.05; 0.05).
The most significant was the reduction of the ratio of sympathetic and parasympathetic regulation (low-frequency waves (LF), ms2/Hz) which was considered by some as a marker of sympathetic modulation (590, 583, 728, respectively, p<0.01; 0.01); and high-frequency waves (HF), ms2/Hz (810, 812, 792, respectively, p<0.05; 0.05). Reduction of index LF / HF was substantial (0.73; 0.72; 0.92; p<0.05; 0.05).

Conclusions: Analysis of vegetative homeostat functioning indicates such disorders of nonspecific resistance in the offspring of people exposed to radiation as decreasing of effectiveness of vegetative regulation of circulation, increasing of parasympathetic regulation rates, reduction of the ratio of sympathetic and parasympathetic regulation. Such violations can cause premature development of CVD in the studied group.

PP.38.15 CIRCULATING ENDOTHELIAL CELLS AS MARKER OF ENDOTHELIAL DAMAGE IN YOUNG PATIENTS WITH LATENT HYPERTENSION

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Objective: Evaluate endothelial damage by level of circulating endothelial cells (CEC) in young patients with latent and manifest arterial hypertension (AH) and match with CEC level in healthy subjects.

Design and method: We evaluated endothelial damage by counting CEC in young patients with latent and manifest AH. Patients, 18 to 39 yrs old, were evaluated (28 with latent AH, 23 with manifest AH). Controls were 19 age-

matched healthy subjects. Latent AH was diagnosed by 24-hour blood pressure (BP) monitoring and 30-s breathhold test, and manifest AH was diagnosed by 24-hour blood pressure (BP) monitoring and manual sphygmomanometry. CEC were counted in plasma (phase contrast microscopy).

Results: Control systolic BP (SBP) = 126.4+±1.8 mm Hg; diastolic BP (DBP) = 83.2+1.1 mm Hg; CEC count = 2.42+0.42 × 10000 cells/L. In manifest AH patients, SBP = 143.2+2.6 mm Hg ($p<0.05$ vs control); DBP = 92.6+1.2 mm Hg ($p<0.05$ vs control); and CEC count = 3.81+0.32 × 10000 cells/L ($p<0.05$ vs control). In patients with latent AH, SBP = 137.8+2.6 mm Hg ($p<0.05$ vs control); DBP = 89.3+1.2 mm Hg ($p<0.05$ vs control); and CEC count = 3.58+0.28 × 10000 cells/L ($p<0.05$ vs control; $p>0.05$ vs manifest AH).

Conclusions: The findings show that both latent and manifest AH were associated with similar degrees of endothelial damage. Therefore, latent AH is as hazardous for blood vessels as is manifest AH. Both manifest and latent arterial hypertension in young patients are associated with increased amount of circulating endothelial cells. The CEC count can be used for detection of early signs of vascular damage induced by latent hypertension.

PP.38.16 FREQUENCY OF MASKED HYPERTENSION IN MIDLIFE WOMEN IN SCREENING

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Objective: To determine the frequency of masked hypertension (MHT) in midlife women in screening.

Design and method: We evaluated 784 women (employees of industrial institution), 40 to 60 yrs old, with initial blood pressure (BP) < 140 and 90 mm Hg with no clinical signs and anamnesis of arterial hypertension (AH) or any evidence of cardiovascular disease (CVD). MHT was diagnosed by 30-s breathhold test (BH test) conducted when excluding any environmental influences on the test findings. Sitting BP was measured initially and remeasured after 30 seconds of breath holding. BH test was considered to be positive when systolic BP increased > 140 mm Hg and diastolic increased > 90 mm Hg. After 2 days in all patients with positive BH test results 24-h ambulatory BP monitoring (ABPM), physical examination and assessment of CVD risk factors intensity were performed.

Results: BH test was positive in 67 patients (8.5%). In all 67 patients data of 24-h ABPM showed threshold exceeding of averaged BP, load indices of BP overtoped 50%. These findings confirm the presence of AH, educed by provocative strain – BH test. During physical examination diastolic dysfunction of the left ventricle was present in 71.6% (48) of women, retinal angiopathy - in 47.7% (32). All 67 patients with positive BH test results had albuminuria. The majority of patients (73%) had CVD risk factors of various intensity.

Conclusions: In screening masked hypertention was diagnosed in 8.5% of midlife women with no complaints and anamnesis of cardiovascular diseases. The presence of masked hypertension in midlife women was accompanied by target lesions, manifesting with albuminuria, diastolic dysfunction of the left ventricular and retinal angiopathy.

PP.38.17 TESTING THE BEHAVIOUR OF BLOOD PRESSURE AND URINARY SODIUM EXCRETION IN RESPONSE TO AN ORAL SODIUM LOAD

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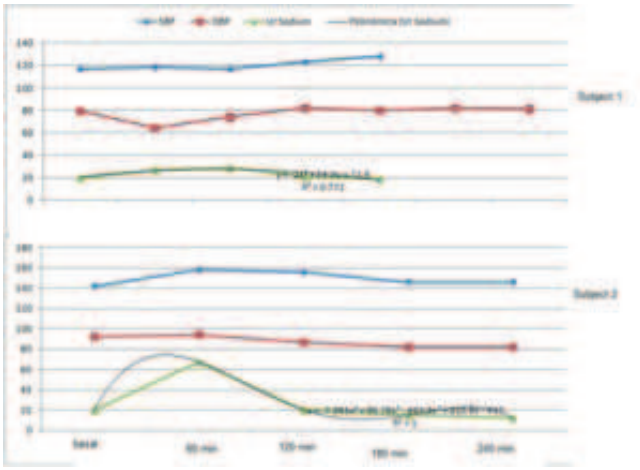
Objective: Salt sensitivity (SS) has been associated with increased cardiovascular risk. However evidence about the usefulness of classifying subjects according to their SS pattern are limited, probably due to the methodological complexities of its determination in clinical practice . Our hypothesis was that the analysis of blood pressure (BP) and urinary sodium excretion (UNa) reponse to an acute oral sodium load could provide elements for a post hoc development of a fast ambulatory SS test .
Our aim was to evaluate BP and UNa response to acute oral salt load and its tolerance.

Design and method: We evaluated 22 subjects in a cardiovascular primary prevention program (48 ± 7.2 years, 40% female, 134 ± 8.2/83 ± 7.9 mm Hg). They were all assigned to a daily 6 gram salt diet for one week before admission. We measured plasmatic aldosterone, renin activity, renal function, potassium, plasmatic/urinary sodium and hemodinamyc condition (impedance cardiography). A soup with 2400 mg sodium chloride was given. BP and UNa were determined basally, and hourly for 4 hours.

Results: After applying exclusion criteria, a final population sample of 7 subjects were included (30% female, a control normotensive and 6 hypertensives). A peak UNa excretion was observed between 60 and 120 minutes after the load, while BP increased at 60 minutes. Although baseline UNa was different among the subjects, probably due to lack of adherence of the prescribed salt intake diet, we observed in 2 subjects with similar basal UNa (figure), a strong difference in the 60 minutes sodium excretion (300 vs 30%). No adverse events were observed.



Conclusions: Outpatient 2400 mg oral load of sodium chloride was safe with no side effects and facilitated the observation of different patterns of response. Limited data were obtained due to the uneven basal sodium of the subjects A larger study could evaluate the effectiveness of an equation of salt sensitivity based on Coruzzi´s et al and adapted to our (limited) observations
Δ basal MAP–240 min MAP /Δ basal UNa- elimination curve area 240 min.

PP.38.18 ASSOCIATION BETWEEN 24 HOUR AMBULATORY BP AND OFFICE BP MEASUREMENT IN NON-DIPPER GROUP

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Objective: Blood pressure measured by physician in clinic office, may not reflect the actual patient's blood pressure. And if we use office BP only, it would be difficult to define and diagnose differentially the subtypes of hypertension of each patient. Clinical studies have shown the 24 hour BP monitoring is better than office BP to predict a prognosis, especially in cardiovascular accident. The aim of the present study was to compare retrospectively the office BP versus 24hour ambulatory BP monitoring in the several subtypes of hypertension to establish to clinical usefulness of 24 hour ambulatory BP monitoring.

Design and method: Between February 2007 and June 2012, retrospective study was done at SNU Boramae Medical center, Seoul, Korea. Patients who visited Seoul Boramae hospital and received 24 hour ABPM examination were consecutively classified into four groups; normotensive, white coat hypertension, persistent hypertension, masked hypertension. And dipper versus non dipper group were evaluated. In each individual, ABPM was applied, and office BP was measured by physicians. The association between the office BP and 24 hour BP was assessed by Pearson's chi-square test.

Results: In 307 hypertensive patients, 24-hour AMPM examination was performed, yielding 280 recordings considered as valid for study analysis. The association was statistically significant between office BP and 24 hour BP of 280 patients, including systolic BP (Pearson correlation coefficients 0.189, p-value 0.001), diastolic BP (0.239, p-value 0.003), mean arterial BP (0.135, p-value 0.024). But, the association was less evident within the four groups; especially systolic BP in normotensive (n=87), white coat hypertension (n=113), persistent hypertension (n=50), and the association of dipper and non-dipper groups in masked hypertension (n=30). In dipper group, office BP and 24 ABPM was not significantly associated on the contrary to non-dipper group.

Conclusions: In conclusion, the association between office BP and 24 hour am-

bulatory BP monitoring was less relevant according to the type of hypertension. Therefore more wide use of the 24 hour ambulatory BP monitoring actively for diagnostic and therapeutic approach may be helpful for the diagnosis and management of hypertension.

PP.38.19 DIAGNOSTICS OF THE HIGH RISK OF ACUTE HYPOTENSION ON 24-H AMBULATORY BLOOD PRESSURE MONITORING BY DATA MINING

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Objective: To diagnose the high risk of the acute hypotensive episodes (AHE) in patients of intensive care unit (ICU) on 24-h ambulatory blood pressure monitoring (ABPM) by artificial intellect algorithm.

Design and method: We used records of ABPM [MIMIC II Database. http://physionet.org/physiobank/database/mimic2db/] of 58 ICU patients with hypotension (mean arterial blood pressure<60mmHg), caused by myocardial infarction, hemorrhage, etc. 43 of them had AHE (high risk group, HR), 15 patients hadn't AHE (low risk group, LR). A support vector machine (SVM) approach - algorithm of Data Mining - was used to classify the features of ABPM time series and predict the occurrence of AHE. The features of ABPM included the set of linear regression coefficients of systolic pressure on pulse pressure. The SVM separates the data, maximizing the distance between the nearest data points of HR and LR classes.

Results: SVM is supervised learning algorithm, that assigns the ABPM time series into category HR or LR. The regression coefficients mapped on features space {Q, a}, where coefficient a has the definite meaning of the index of heart-vessels interaction and Q is nonpulse pressure. HR and LR classes in features space divided by optimal separating curve. Thus the regression coefficients of test ABPM data are mapped on features space and belonging to HR or LR classes is determined, depending of which side of the separating curve they fall on. The errors matrix in our research for test data set: 1 false negative diagnosis in HR group, 2 false positive diagnoses in LR group.

Conclusions: We have proposed the diagnostics method of high risk AHE based on the linear regression modeling of ABPM data, followed by the application of SVM binary classifier. We used 2-dimensional vector of the features, whose coordinates are the linear regression coefficients of systolic pressure on pulse pressure. We have showed that the classification based only two attributes gives the high-grade quality of differentiation by risk of AHE -93%.

PP.38.20 COMPARISON OF PULSE WAVE VELOCITY, AUGMENTATION INDEX AND AORTIC SYSTOLIC BLOOD PRESSURE MEASURED IN STATIC CONDITIONS BY THE MOBIL-O-GRAPH AND THE SPHYGMOCOR DEVICES IN END-STAGE

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Objective: A novel automatic oscillometric brachial cuff-based device (Mobil-o-Graph, IEM, Stolberg, Germany) assesses non-invasively aortic systolic blood pressure (aSBP), aortic augmentation index (AIx) and pulse wave velocity (PWV) in ambulatory conditions. Previous studies comparing the validity of this device with the currently most widely applied non-invasive tonometry-based device (Sphygmocor, ArtCor, Sydney, Australia) showed acceptable agreement between the 2 devices for aSBP and AIx measured in static conditions in healthy and hypertensive individuals and slight underestimation of PWV by the Mobil-O-Graph device. This study aimed to investigate for first time the agreement between these devices in end-stage renal disease (ESRD) patients.

Design and method: In 49 consecutive hemodialysis patients (30 male and 19 female) with a mean age of 59.6±15.7 years, aSBP, AIx adjusted for 75 heart beats/min (heart rate-adjusted AIx) and PWV were measured with both devices (order: Sphygmocor then Mobil-O-Graph) after 10 min of rest in the supine position, according to the manufacturer's operational recommendations. BP for the calibration of the Sphygmocor waveform was measured with a standard mercury sphygmomanometer.

Results: aSBP, heart rate-adjusted AIx and PWV measured with the Sphygmocor did not significantly differ from the relevant measurements obtained with the Mobil-O-Graph device for all 3 hemodynamic parameters (aSBP: 136.3±20.5 vs 132.7±19.1 mmHg, P=0.113; heart rate-adjusted AIx: 28.7±9.9 vs 30.0±12.2%, P=0.477; PWV: 9.7±2.8 vs 9.3±2.0 m/sec, n=42, P=0.344, for Sphygmocor vs Mobil-O-Graph respectively). The insignificant difference for aSBP was similar to and probably explained by the difference in the peripheral SBP used for waveform's calibration (147.1±21.5 vs 144.2±20.4 mmHg, P=0.274, for Sphygmocor vs Mobil-O-Graph respectively). Measurements of all 3 hemodynamic parameters obtained with the Sphygmocor showed significant associations with the relevant measurements taken with the Mobil-O-Graph device (r=0.697, P<0.001 for aSBP, r=0.347, P<0.05 for AIx and r=0.613, P<0.001 for PWV, respectively). The Bland-Altman Plots for aSBP, AIx and PWV showed acceptable agreement between these devices, without evidence of systemic bias.

Conclusions: Acceptable agreement between devices was evident for aSBP, AIx and PWV in ESRD patients. aSBP and PWV were slightly underestimated by the Mobil-O-Graph compared to Sphygmocor device.

PP.38.21 2-D STRAIN CAN PREDICT EFFECTIVELY ATRIAL FIBRILLATION IN HYPERTENSIVE PATIENTS

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Objective: Hypertension leads to left atrial and ventricular dysfunction, which often presents in the form of atrial arrhythmias. Two-dimensional (2D) strain, a new echocardiographic technique based on speckle tracking, enables simultaneous evaluation of the 3 components of myocardial deformation. The aim of this study was to assess whether 2-D strain can predict the occurrence of atrial fibrillation (AF) in hypertensive patients with preserved ejection fraction.

Design and method: 112 hypertensive patients and 25 normal subjects with preserved EF and sinus rhythm were included. Patients were studied by a conventional echocardiographic study. The images were analyzed offline using Q-Lab workstation with 2-D strain analysis software that is based on the 17-segment model.
Left ventricular function was assessed at long axis using longitudinal strain and at short axis using circumferential strain. Left atrial function was assessed in the apical long axis using peak atrial strain and atrial systolic strain at the phase of atrial systole.
All patients were followed-up regularly at 3-6months. In between visits, a 48-hour ECG monitoring (Holter) was performed in order to detect episodes of silence AF.

Results: Irrespectively of the presence of left ventricle hypertrophy, left atrial strain was lower in hypertensive patients in comparison to normotensive patients. Peak atrial strain (32.8+/-11) as well as circumferential left ventricular strain (-20.1+/-9.3) in patients with hypertension, was lower vs controls (41.8±11.3) (p=0.003), (-14.8+/-4.4) (p=0.01), respectively. In addition, in patients with atrial fibrillation, peak atrial strain (22.9± 8.2) and longitudinal left ventricular strain (-15.7± 3.9) was significantly lower in comparison with hypertensive patients (p=0.001) and controls (p< 0.001) respectively.

Conclusions: Two-dimensional strain can be used to identify latent left ventricular and left atrial dysfunction in hypertensive patients and so it may be a useful marker for the identification of high risk for AF occurrence in hypertension. Impairment of left atrium myocardial dynamics may be one of the reasons of AF development in patients with essential hypertension.

PP.38.22 PULSE WAVE VELOCITY. BIOLOGICAL BEHAVIOUR AND CHARACTERISTICS IN HYPERTENSIVE PATIENTS. A PROSPECTIVE STUDY OF MORE THAN 10.000 SUBJETCS

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Objective: Pulse wave velocity (PWV) represents an established risk factor in hypertensive patients. Increased PWV values are associated with worse outcome and PWV measurement represents a significant marker in order to assess total

cardiovascular risk. This study had the purpose to assess the biological behavior and characteristics of PWV in hypertensive patients.

Table: Baseline Characteristics

		CONTROLS			HYPERTENSIVES		
		Mean	Std Dev.	N	Mean	Std Dev.	N
AGE		51	11	3243	61	11	6860
BMI		26,67	11,26	3241	28,19	12,38	6859
SYSTOLIC_BP		123,03	10,40	3243	147,43	21,37	6860
DIASTOLIC_BP		75,82	8,29	3243	86,89	11,62	6860
HEART_RATE		71,09	10,78	3243	71,87	16,91	6860
BMI_categ	Underweight	16,72	3,55	43	15,08	5,31	48
	Normal weight	22,51	1,69	1300	23,06	1,50	1485
	Overweight	27,16	1,37	1283	27,48	1,39	2676
	Obese class I	31,89	1,37	496	32,05	1,40	1761
	Obese class II	36,90	1,36	91	36,97	1,38	506
	Obese class III	87,09	96,33	28	60,00	63,92	193
GENDER	FEMALE			1937			4179
	MALE			1298			2672
SMOKER	Non Smoker			1911			5046
	Smoker			1332			1814

Design and method: We prospectively studied 10.103 subjects (3243 controls, 6860 hypertensive patients) from five outpatient hypertensive clinics (in Serbia and Greece). In all patients anthropometric characteristics as well as medical history and antihypertensive regiment was recorded. The statistical behavior of PWV was tested with respect to qualitative parameters such us gender and smoking, as well as quantitative variables such us age, BMI, systolic BP, diastolic BP and heart rate. Non parametric-test Kruskal-Wallis was utilized in order to identify the variance of PWV between control and hypertensive patients. Regression analysis was performed for all the previously mentioned parameters. Pearson's correlation test was used to asses the statistical behavior of PWV compared to the patient's baseline characteristics.

Results: PWV distribution was weighted by age due to conditionality of variance. Kruskal_wallis test revealed that PWV has a statistically significant different distribution between controls and hypertensive patients ($p< 0.001$). The magnitude of PWV increase, was related to BP category classification (from optimal to stage III hypertension) ($p<0.001$). Pearson's correlation revealed a significant association of PWV practically with all major baseline characteristics of hypertensive patients (BMI, Gender, Age, Systolic BP, Diastolic BP, Smoking status and heart rate) ($p<0.001$). This association was retained after adjustment of PWV confounders. Multiple regression analysis showed that antihypertensive drug therapy does not affect the statistical significant distribution of PWV in hypertensive patients.

Conclusions: PWV is increased in hypertensive patients, the degree of PWV increase, is associated with baseline blood pressure levels (independently of the antihypertensive drug regiment used as well as anthropometric variables).

PP.38.23 PRELIMINARY REPORT ON INITIAL EXPERIENCE IN 24 HOURS AMBULATORY BLOOD PRESSURE MEASUREMENT IN NIGERIA: A DESCRIPTIVE STUDY

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Objective: The superiority of 24 hour ambulatory blood pressure monitoring (ABPM) over office blood pressure (OBP) in predicting hypertension control/ outcome is well established. Despite the growing burden of hypertension and its complications in Africa, the use of ABPM remains rudimentary in the region. We sought to highlight our initial experience in ABPM among Nigerian patients.

Design and method: This was a preliminary study involving a cohort of 26 known hypertensive patients referred to DOCS Heart Centre, Enugu, Nigeria between May and December 2013. OBP was taken in both arms in a sitting position using an oscillometric BP device, GE Dinamap ProCare 400 Monitor, the one with the higher value taken as the patient's BP. Subsequently, each patient was hooked on Tonoport V [GE CS V6 71(21)] for a minimum of 24 hours and analyzed using the GE CardiosoftTM ABP application software . ABPM readings were interpreted using British Medical Council guidelines. Data were analyzed using EPI info (version 3.3.5).

Results: The mean age and BMI of the patients were 57±16 years and 29.0±5.9Kg/m2 respectively, with 14(53.8%) being women. The mean OBP was 150±16/88±14mmHg; 10/26 (38.5%) being controlled. The mean ABP parameters were as follows: 24 hour BP 138±15/84±18mmHg, daytime BP 140±16/85±10mmHg, Nighttime BP 134±18/29±9mmHg, and Waking BP 144±24/87±17mmHg. Normal BP was recorded in 15.4%, borderline hypertension 38%, clear hypertension 46.2%, white coat hypertension 15.4%, and nocturnal hypertension 19.2%. Analysis of Systolic BP dipping showed reverse dipping in 23.1%, extreme dipping in 7.7%, non-dipping in 46.2% and normal dipping in 23.1%.

Conclusions: ABP record among our patients showed very poor control, especially regarding recognized markers of bad prognosis in hypertension a possible clue to the high incidence of target organ damage/ poor outcome in our hypertensive patients. This finding of higher proportion with controlled BP on OBP monitoring than ABPM would suggest that many of the patients have masked hypertension. The preponderance of abnormal dipping patterns calls for increased use of ABPM to assess risk profile/guide therapy and more pragmatic approach for optimal patient management to mitigate adverse outcomes among hypertension patients in sub-Saharan Africa.

PP.38.24 KNOWLEDGE, ATTITUDE AND UTILITY OF ECG AMONG FAMILY MEDICINE RESIDENTS IN NIGERIA

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Objective: There is limited information on the utility of electrocardiogram (ECG) in General practice in Nigeria. We assessed the knowledge, attitude and utility of ECG among Nigerian Family Medicine residents.

Design and method: A cross-sectional evaluation was conducted in four Family Medicine training centres in Nigeria. Using a self-administered questionnaire information on the resident doctor's ECG requests, preferred source of interpretation, most common ECG diagnosis and update of ECG knowledge were obtained.

Results: Only 61 out of 120 questionnaires (50.8%) were returned. The respondents were mostly between 31-40 years (54.7%); predominantly males (73.8%) and senior residents (65.6%). Fifty four (88.3%) made <5 ECG requests/week and the commonest indication was hypertension (50%). Their ECG interpretation was mostly self-reported (41%), followed by cardiologist (26.5%) or automated reports (21.3%). Self-reporting of ECG was commoner among senior residents ($p<0.01$). Left ventricular hypertrophy was the commonest ECG diagnosis (55.8%). Majority (69%) did not update their ECG knowledge. Half of them desired further learning on basic ECG interpretation. Teaching ECG in updates/CMEs was adjudged the best way to improve knowledge/utility (61.1%).

Conclusions: The attitude and utility of ECG among Family Medicine residents in Nigeria is poor. Improvement through curriculum revision, hands-on tutorials and CMEs is highly recommended.

PP.38.25 PREDICTION OF LEFT VENTRICULAR DIASTOLIC DYSFUNCTION IN PATIENT WITH ARTERIAL HYPERTENSION

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Objective: Arterial hypertension (HTN) causes left ventricular (LV) cavity dysfunction even if ejection function (EF) remains preserved. Recent studies have shown that diastolic dysfunction and left atrial (LA)size, LA volume meas-

urement, LA empting fraction, E/E1 ratio are recognized as predictors of LV diastolic dysfunction. The objective of this study was to assess whether complex LAFI (left atrium functional index) had additional value in definition and grading of diastolic dysfunction and compare with indices of atrial myocardial deformation – longitudinal strain.

Design and method: Peak atrial longitudinal strain (PALS) was evaluated in 82 patients with systemic HTN and preserved EF (>= 55%) divided in 41 patients with diastolic dysfunction but no hypertrophy (HTNdd), and 41 patients with no diastolic dysfunction or hypertrophy (eHTN). Results were compared with those from 22 age- and gender-matched healthy controls.

Results: Indexed LA area and indexed LA volume were within the normal range and not different between the two groups and controls. eHTN group had reduced global PALS (33.23±2.3 %)($p < 0.01$) and four-and two-chamber average PALS (36.12±1.8 %)($p < 0.01$ for both). Similar abnormalities were seen in HTNdd but to a worse degree ($P < 0.001$ for both 28.19±2.3). LV EF was not different between the eHTN and HTNdd groups compared to controls. LV E/e' ratio was the strongest predictor of reduced global PALS in both eHTN and HTNdd groups. Statistical analysis showed that LAFI was reduced significantly in pts with HTH and LV diastolic dysfunction($p< 0.05$) and related to the degree of dysfunction ($p<0.01$, $r= 0.46$) .The best cut off for LAFI was bellow 0.35 cm/m2. In pts with restrictive pattern of mitral flow, LAFI was bellow 0.15 cm/m2. Longitudinal strain was significantly decreased in pts with severe LVH.

Conclusions: Asymptomatic HTN patients with preserved LVEF and normal diastolic function have compromised LA strain despite normal cavity size, consistent with preclinical LA myocardial dysfunction. LAFI and PALS are very sensitive parameters for assessing of LA function and potent predictors for estimate the LV diastolic dysfunction in hypertensive patients.

PP.38.26 NON-DIPPING PATTERN IN UNTREATED HYPERTENSIVE PATIENTS MIGHT BE ASSOCIATED WITH PULSE WAVE VELOCITY INDEPENDENT OF RAISED NOCTURNAL BLOOD PRESSURE

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Objective: Non-dipper pattern, characterized by diminished nocturnal decline in blood pressure (BP), is associated with an increase in cardiovascular events. Pulse wave velocity (PWV) reflects systemic arterial stiffness, and a simple method of measuring brachial-ankle PWV (baPWV) has been made available. This study aimed to access association between baPWV as the surrogate of arterial stiffness and non-dipper pattern in untreated hypertensive patients.

Design and method: The subjects consisted of 293 patients followed at the cardiology of our center with a new diagnosis of essential hypertension for which they had never received treatment between 2011 and 2012. They underwent a standardized medical history and examination, laboratory tests and echocardiography and ambulatory blood pressure monitoring (ABPM). The degree of reduction of night-time BP was calculated as (1- night-time SBP/day-time SBP)*100.

Results: The patients were 155 men and 138 women (53:47%) with mean age of 45.9 yearsand mean body mass index of 25.4kg/m2. Patients with diabetes were none and patients with smoking were 36 (12.6%). Mean BP is 142.3/89.4 (day-time mean BP: 146.0/96.4, night-time mean BP: 131.9/86.9mmHg). Mean of baPWV is 1512.7cm/sec. The degree of reduction in night-time BP (mean: 9.6%) is negative correlation with baPWV ($r=0.304$, $p<0.000$). (Figure) In multivariate logistic linear regression including age, gender, BP and PWV measurements, baPWV ($p=0.047$) is the independent significantly correlation with the degree of reduction of night-time BP.

Conclusions: In this study, diminished nocturnal decline in BP is independently associated with baPWV. And, non-dipper and reverse-dipper pattern might be related to increased baPWV and increased cardiovascular risk in untreated hypertensive patients.

PP.38.27 ARE THYROID MICROCARCINOMAS POSSIBLY RELATED TO LABILE HYPERTENSION?

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Objective: Cancers of the thyroid gland have a spectrum of behavior that ranges from incidentally detected and clinically inconsequential microadenomas to aggressive anaplastic malignancies. Thyroid cancer is 3 times more common in women. Our objective was to investigate the possible association of the incidental thyroid microadenomas to a specific uncommon hypertension pattern.

Design and method: 107 male hypertensive patients referred to our outpatient hypertension office the last year for consultation due to unresponsiveness to therapy, were selected for the initial analysis. We further selected 84 who had no history or records of thyroid disease. 23 of this group had been diagnosed with labile hypertension and among the treatment prescribed, they had been given benzodiazepines for hypertensive - anxiety attacks.
For the initial workup of these patients we performed thyroid function tests (T3, T4, TSH), thyroid autoantibodies (anti-TPO, anti-TG) as well as thyroid ultrasound. Patients with confirmed thyroid disease or nodules were referred to endocrinologist for further workup.
For the analysis we used the paired t test and unpaired t test for secondary regression analysis.For the null hypothesis we considered the total group of patients with no thyroid cancer diagnosis had been made.

Results: The following table explains the data analysis.

		Thyroid cancer
Hypertension patients	n=107	0
Patients with no thyroid data	n= 84	1
"Labile" hypertension	n= 23	6

The two-tailed P value equals 0.0590. By conventional criteria, this difference is considered to be not quite statistically significant.

Conclusions: A few patients diagnosed by non hypertension experts as having labile hypertension,were marginally non-statistically significant for thyroid inconsequential microadenomas (papillary type). Our analysis has limitations, including the small number of patients initially included. However, considering the 98% 5-year survival rate of this cancer type when diagnosed early, thyroid blood tests and ultrasound should definitely be included in the diagnostic workup of this patient profile.

PP.38.28 PULSE WAVE VELOCITY AND NT-PRO BNP IN PATIENTS WITH CHRONIC KIDNEY DISEASE

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Objective: Arterial stiffness is a marker of vascular damage and independent predictor of a cardiovascular (CV) events. The aim of our study was to investigate the relationship between arterial stiffness measured by carotid-femoral pulse wave velocity (PWV) and serum cardiac biomarker of left ventricular dysfunction (LVD) N-terminal pro-brain natriuretic peptide (NT-pro-BNP) in CKD patients.

Design and method: We performed a cross-sectional study in a cohort of 82 non-dialysis CKD patients. Arterial stiffness was assessed by PWV (SphygmoCor, Atcor Medical, Australia). NT-pro-BNP and other CV risk factors (troponin I, cystatin C, cholesterol, LDL, HDL, triglycerides, hs-CRP) were measured. The patients were asymptomatic regarding heart failure and were divided into two groups according to the median value of the PWV: lower PWV group (PWV<11.58 m/s, n=41), higher PWV group (PWV>11.58 m/s, n=41).

Results: Mean age of patients was 59.77 ± 13.5 years, 68.3% were men, 24.4% had diabetes, 41.5% were smokers. Other descriptive data for all patients and both groups are presented in Table. Using Mann-Whitney test we found statistically significant difference between both groups in age ($P<0.0001$) and NT-pro-BNP ($P<0.001$) but not in other CV risk factors.

Variable	All patients (n=82)	Lower PWV group: PWV<11.58m/s (n=41)	Higher PWV group: PWV>11.58m/s (n=41)	P-value
Age (years)	59.77±13.5	52.44±13.2	67.09±9.22	<0.0001
Cystatin C (mg/L)	2.09±0.87	2.02±0.88	2.16±0.86	0.507
Cholesterol (mmol/L)	5.02±1.37	5.12±1.45	4.92±1.29	0.525
LDL Cholesterol (mmol/L)	3.08±1.1	3.14±1.18	3.02±1.02	0.791
HDL Cholesterol (mmol/L)	1.2±0.37	1.19±0.29	1.21±0.44	0.831
Triglycerides (mmol/L)	2.4±3.24	2.73±4.4	2.09±1.36	0.86
hs-CRP (mg/L)	5.8±11.56	4.12±5.85	7.49±15.19	0.284
Troponin I (µg/L)	0.022±0.13	0.02±0.01	0.025±0.18	0.159
NT-pro-BNP(pmol/L)	116.06±177.26	88.37±170.42	143.76±181.69	<0.001
BMI (kg/m^2)	28.57±5.17	28.59±5.23	28.56±5.16	0.978

Conclusions: According to our results NT-pro-BNP is an early marker of asymptomatic LVD in non-dialysis CKD patients with higher PWV.

PP.38.29 CORRELATION OF PULSE-WAVE ANALYSIS AND ECHOCARDIOGRAPHIC PARAMETERS IN PATIENTS WITH HIGH RISK HYPERTENSION

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Objective: To investigate the association among pulse-wave analysis indices and echocardiographic parameters of left ventricle (LV) in patients with high risk arterial hypertension (AH).

Design and method: Fifty two patients with high risk AH (SCORE>5 %, mean age 63±10 years) were enrolled in the study. The following pulse-wave characteristics were measured with novel finger photoplethysmographic device AngioScan-01: stiffness index (SI), reflection index (RI), augmentation index adjusted to a heart rate of 75 (AIx75) and vascular aging (VA). LV dimensions were measured by echocardiography (ECHO-CG): interventricular septum (IVS), left ventricle mass (LVM), left ventricle diastolic diameter (LVDd), left ventricle diastolic volume (LVVd).

Results: The mean±Standart Deviation in SI was 7,68±0,96 m/s, RI 33,51±18,02 %, AIx75 8,87±16,15 %, VA 53,23±20,96 years, IVS 1,07±1,16 sm, LVM 198,94±47,11g, LVDd 4,84±0,32 sm, LVVd 110,82±17,52 ml. Correlation coefficients were: AIx75 v. LVDd (r=-0,29) and LVVd (r=-0,31) all with p<0,05; VA v. LVDd (r=-0,39), LVVd (r=-0,39) all with p<0,05). SI v. IVS (r=-0,31), LVVd (r=-0,27), LVM (r=-0,31) all with p<0,05. There were no significant correlations between RI and ECHO-CG parameters.

Conclusions: Pulse-wave analysis demonstrated elevation of peripheral vasoconstriction and prevalence of A and B curves. There was significant correlation between AIx75, SI, VA and LV structure in patients with high risk hypertension.

PP.38.30 SEVERE HYPERTENSION IN MEDULLARY SPONGE KIDNEY (CACCHI-RICCI DISEASE). CASE REPORT

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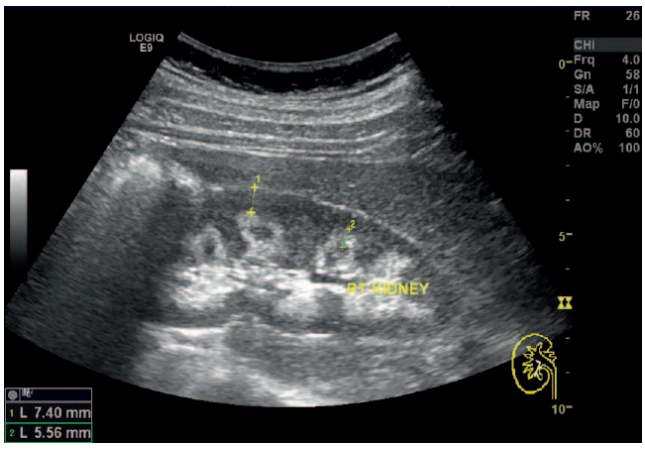
Objective: Medullary sponge kidney (MSK) is a congenital anomaly characterized by diffuse ectasy of the collecting tubules of one or both kidneys. It is usually diagnosed in the second or third decade of life, mostly seen in adult females. It generally manifests with nephrocalcinosis and recurrent renal stones; other signs may be renal acidification and concentration defects, and pre-calyceal duct ectasias. MSK is generally considered a sporadic disorder, but an apparently autosomal dominant inheritance has also been observed.
To present a case of medullary sponge kidney (Cacchi-Ricci disease) in a 33-years-old woman with severe hypertension with special reference to the ultrasound findings that permitted early diagnosis of this rare condition.



Design and method: The most relevant clinical features and ultrasound findings in a patient with Cacchi-Ricci disease are described.

Results: We describe here a 33-years-old Moldavian woman with negative family history for hypertension who presented to the physician with severe hypertension, established in a couple of months after childbirth, and resistant to usual treatment with angiotensine conversion enzyme inhibitors. She also had concomitant features of distal renal tubular acidosis (alkaline urine, hypercalciuria). Extensive diagnostic workup was undertaken to find secondary causes for it. The most informative proved to be renal ultrasound which revealed bilateral increased medullary echogenicity, highly suggestive for MSK.

Conclusions: Medullary sponge kidney disease might be responsible for secondary hypertension, and simple kidney ultrasound increase the probability of early diagnosis of this rare condition.

PP.38.31 THE EARLY LEFT VENTRICULAR SYSTOLIC DYSFUNCTION IN PATIENTS WITH AORTIC STENOSIS IS REFLECTED IN ELECTROCARDIOGRAM

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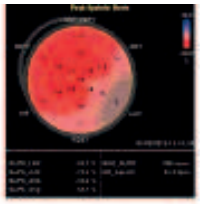
Objective: To assess the relationship of electrocardiogram (ECG) parameters of left ventricular hypertrophy (LVH) with LV myocardial deformation by using of 2D strain in degenerative aortic stenosis (AS) patients with preserved LV ejection fraction (EF).



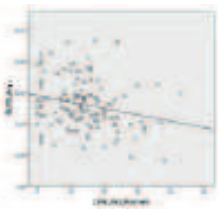


Figure 1. The example of evaluation of global longitudinal peak systolic strain for the whole LV by "bull-eye". The basal posterior segment of LV had aneurysmal visualization and was excluded from the analysis (X).

Figure 2. Correlation analysis of global longitudinal peak systolic strain for the whole LV (GLPS_Avg) with Cornell index (LVH_ind_Cornell).

Table. ROC analysis of ECG left ventricular hypertrophy criteria with global longitudinal peak systolic strain in patients with aortic stenosis.

Parameter	LVH*	LV dysfunction†
Sokolow-Lyon index	0,491	0,410
Sokolow-Lyon index > 35 mm	0,500	0,548
Cornell index	0,654	0,825
Cornell index > 28 mm male and > 20 mm female	0,545	0,776
Gubner index	0,620	0,736
Gubner index > 25 mm	0,500	0,675
Maximal R in V1-V6	0,486	0,431
R in aVL	0,625	0,786
Sokolow-product	0,521	0,424
Sokolow-product > 3710 mm*ms	0,479	0,562
Cornell-product	0,647	0,824
Cornell-product > 2440 mm*ms	0,592	0,768
LV strain pattern V4-V6	0,548	0,625

* - LVH evaluated as myocardial mass (g) / BSA (m²): ♀ 116 g/m² male and ♂ 134 g/m² female
† - LV dysfunction evaluated as GLPS_Avg < -13%

Design and method: We enrolled 80 patients (75% female, 77,4±8,59 years) with AS of all degrees. The standard echocardiography, 12-chanal ECG were performed. The patients with LV EF less than 50% and LV contractility dysfunction were excluded. The early LV systolic dysfunction was determined via myocardial longitudinal deformation estimated by 2D speckle tracking echocardiography from apical two, four-chambers and long-axis views. Strain measurements were averaged to obtain the global LV strain value (Fig 1). The voltage indexes (Sokolow-Lyon (RV5(V6)+SV1(V2)), Cornell (RaVL+SV3) and Gubner (RI+SIII)), the duration products (Sokolow-Lyon and Cornell) and LV strain pattern were calculated. Statistic program SPSS 17.0 was used. Receiver-operating-characteristics analysis was carried out to calculate the area under the curve (AUC) to evaluate the diagnostic performance of ECG LVH criteria. A p-value < 0.05 was considered statistically significant.

Results: The average LVEF was 66,3±8,87%, aortic valve area (AVA) – 1,1±0,30sm2. The patients had elevated LV myocardial mass index (109,1±30,01g/m2). The average global longitudinal strain (GLS_Avg) was less than normal value (-17,4±3,85%). The average ECG LVH parameters were in normal range. There was no correlation of GLS_Avg with LV myocardial mass index, but we detected strong reverse correlations of GLS_Avg with ECG LVH parameters: Cornell index r = -0,338, p=0,003; Cornell product r= -0,299, p=0,007; Gubner index r = -0,281, p=0,013; LV strain r= -0,289, p=0,010 (Fig 2). The diagnostic performance of ECG LVH parameters to detect severe decrease GLS_Avg less than -13% were very good for Cornell index (AUC =

0,825) and Cornell product (AUC = 0,828) and good for Gubner index (AUC = 0,736) (table on the prevoius page).

Conclusions: Cornell and Gubner ECG LVH criteria demonstrated low sensitivity of real LVH but are predictors of the presence of early LV systolic dysfunction in patients with preserved LV EF.

PP.38.32 COMPARATIVE EVALUATION OF REPRODUCIBILITY OF 12-LEAD AVERAGED AND CONVENTIONAL ELECTROCARDIOGRAPHY

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Objective: Our aim was to compare the reproducibility of 12-lead time averaged and conventional ECG.

Design and method: The study involved 20 young healthy volunteers (10 men and 10 women, mean age 20.4±1.8 years) examined twice with one week interval. 12-lead ECG recordings were acquired during 5 minutes using computerized ECG device at each examination for conventional and averaged ECG analysis. Mathematical averaging of ECG in each lead at 5 min interval was performed using original program "HR ECG". The sum of P wave, PQ interval, and QRS duration (durations) and the sum of P, Q, R, S, T waves amplitudes (amplitudes) in lead I were used for reproducibility evaluation.

Results: Mean values of durations between two examinations of conventional ECG and time averaged ECG were 0.406 sec and 0.417 sec, respectively, (p=0.24), standard deviation of differences between first and second examination were 0.053 sec and 0.020 sec, respectively, (variation coefficients ±13% versus ±5%, p<0,01). Mean values of amplitudes between two examinations of conventional ECG and time averaged ECG were 0.712 mV and 0.696 mV, respectively, (p=0.78), standard deviation of differences between first and second examination were 0.087 mV and 0.050 mV, respectively, (variation coefficients ±12% versus ±7%, p<0.01).

Conclusions: Thus, the reproducibility of the time averaged is more than 2.5 times higher than the conventional ECG for intervals duration and nearly twice higher for waves amplitude. The use of the method in studies with ECG control may significantly decrease the time of a study or groups size needed to reach statistically significant differences.

PP.38.33 MICROALBUMINURIA IN THE CARDIOLOGY DEPARTMENT OF BLIDA, ALGERIA

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Objective: The present study was designed to investigate the prevalence of microalbuminuria and factors that associate with urine excretion of albumin in the general population.

Design and method: Participants in a health checkup program in our hospital were enrolled in this study (n =2345, 53.4 ± 13.8 years old). Besides the routine checkup program (an interview regarding health status, physical examination, chest X-ray, electrocardiography, and laboratory assessment of cardiovascular risk factors), urine samples were collected for the measurement of albumin concentrations, which were expressed as the ratio of urine albumin to creatinine concentrations (UACR [mg/g Cr]). The analytical range of UACR was >= 5 mg/g Cr and individual salt intake was assessed by estimating 24 hours urinary salt excretion, which was calculated by a previously reported formula.

Results: The blood pressure of participants was 135 ± 16 mmHg and 28.7% and 12.1% of participants were with hypertension and diabetes mellitus, respectively. Urine albumin was detected in 1,378 subjects (40.1%) (30 > UACR >= 5 mg/g Cr, 45.0%; UACR >= 30 mg/g Cr, 8.1%). Multivariate regression analysis revealed that abnormal albuminuria (UACR >= 30 mg/g Cr) was correlated with systolic blood pressure, estimated 24 hours urinary salt excretion, and fasting plasma glucose after adjustment for possible factors (p < 0.0001). In participants with detectable albuminuria (UACR >= 5 mg/g Cr, n = 1,378), UACR was independently correlated with systolic blood pressure, estimated 24 hours urinary salt excretion, uric acid, and fasting plasma glucose (p < 0.01). Similar results were obtained in analyses performed in a subgroup of participants without any medication (n = 983).

Conclusions: The prevalence of microalbuminuria was about 7,5% in the population of study. The urinary excretion of albumin was closely associated with blood pressure, diabete and salt intake, suggesting the importance of salt restriction, balances of diabete for the prevention of end-stage renal disease and cardiovascular disease.

PP.38.34 IMPLEMENTATION OF AN HYPERTENTION MANAGEMENT TRAINEESHIP FOR NURSES IN PRIMARY HEALTH CARE

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Objective: In Canada, hypertension guidelines support professionals for hypertension management. Although studies performed since the implementation of these guidelines show improvement in management of hypertension, there are still 14.4% of patients on treatment that do not reach target values. Current data shows that nursing interventions can be optimized to achieve better control of hypertension. The aim of the study protocol proposed here is to appraise how the introduction of a coaching process combining different strategies such as education, clinical tools and clinical coaching influences knowledge and practice of nurses.

Design and method: The sample will be comprise of 3 to 4 primary care settings that have followed patients for hypertension, a sample of 6 nurses will be selected. The action research design will be used to tailored interventions to the needs of the selected primary care organizations. Three of the four components of Kirkpatrick's model will be used to appraise the influence of the coaching process on satisfaction with the training, knowledge and skills acquired. The first phase will be educating nurses on hypertension. It will consist of an on line course that covers basic and advance knowledge in hypertension. A questionnaire will be used to assess learning. The second phase will aim at consolidating theoretical learning with clinical encounters through clinical cases. The third phase will involve the evaluation of nurse's practices through a medical record audit. Quality indicators elaborated for primary care will be used. Throughout the project, the research team will be actively involved to meet the needs of the participants and support them.

Results: Results will be available in June.

Conclusions: The protocol and results of this project should be shared in order to generate discussions among professionals concerning components that influence the implementation of the best practices in hypertension. Nurse play a major role in hypertension care and better defining the training programs needed appears essential.

PP.38.35 CAN WE EMPLOY CA2+ CHELATORS FOR IDENTIFICATION OF CELLULAR RESPONSES EVOKED BY CA2+I-MEDIATED EXCITATION-TRANSCRIPTION COUPLING?

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Objective: Intracellular Ca2+ overload contributes to the pathogenesis of hypertension via altered cellular responses including Ca2+i-mediated excitation-transcription coupling. Extra- (EGTA) and intracellular (BAPTA) Ca2+ chelators are widely employed for analysis of the role of Ca2+ in cellular functions both in vitro and ex vivo. To examine the role of Ca2+i-mediated signaling, we studied actions of EGTA and BAPTA on transcriptome of smooth muscle cells from rat aorta (RASMC).

Design and method: RASMC were incubated for 3 hr in control medium, K+-free medium, in the presence of ouabain or in Ca2+-free medium containing 50 uM EGTA and 10 uM BAPTA-AM. Intracellular K+ and Na+ content was measured as the steady-state distribution of 86Rb, and 22Na, respectively. Total RNA was extracted and processed with a reverse transcription generating sense-strand cDNA as final product. cDNA was fragmented and labeled by Affymetrix GeneChip® kit.

Results: Na+,K+-ATPase inhibition by ouabain and K+-free medium altered expression of 4610 and 3677 transcripts, respectively. Among them we found 1844 genes whose expression was affected by both stimuli thus suggesting a key role of elevated [Na+]i/[K+]i ratio. Addition of EGTA and BAPTA resulted in elevation of [Na+]i by and attenuation of [K+]i by ~3- and 12-fold, respectively, that was caused by elevation of the permeability of the plasma membrane for Na+ and K+ documented in the presence of ouabain and bumetanide. Among Na+i/K+i-sensitive genes whose expression was also affected by Ca2+ depletion by more than 4-fold we found activating transcription factor Atf3, early growth response Egr1, Egr2 and Egr3, regulator of G-protein signaling Rgs2, nuclear receptor subfamily 4 group A Nr4a2 and Nr4a3, inositol 1,4,5-trophosphate 3-kinase Itpkc. Both elevation of the [Na+]i/[K+]i ratio and augmented expression of these genes triggered by Ca2+-deletion were abolished under dissipation of transmembrane gradient of monovalent cations in low-Na+, high K+-medium. Elevation of the [Na+]/[K+] ratio plays a key role in transcriptomic changes triggered by Ca2+ chelators.

Conclusions: There results have profound implications for the analysis of data obtained in Ca2+ depleted cells and relevance these findings to the pathogenesis of hypertension.

PP.38.36 NATIONAL PROJECT ON INTRODUCION STATE REGULATION OF A MEDICAMENT FOR TREATING PERSONS WITH HYPERTENSION

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Objective: In April 2012, on the initiative of the Cabinet of Ministers of Ukraine was initiated a pilot project to introduce state regulation of prices for medicines to treat people with hypertension. For a pilot project in 2013 Ukraine government allocated 191,636,300 UAH.The list of drugs involved in the pilot project: enalapril, lisinopril, amlodipine, nifedipine, metoprolol, bisoprolol, nebivalol and combined drugs: enalapril in combination with hydrochlorothiazide, lisinopril in combination with hydrochlorothiazide, amlodipine in combination with lisinopril.

Design and method: Since December 2012 was created an initiative group (800 people), which consisted of students from Bogomolets National Medical University residing in different regions of Ukraine. The main purpose was to visit 20 people of them region. 16,000 questionnaires were distributed and students had to measure the pressure of each patient.

Results: Processed 13,343 questionnaires containing medical history, and demographic data on social status, 3,245 suffering from arterial hypertension, representing 24.3 % of the people surveyed in different regions of Ukraine. First found hypertension was in 17.4 %. The demographic characteristics of the patients with hypertension showed that among patients with predominant urban population 57.6 % of the population is rural - 42.4 %. Value for male and female was 53.8 % and 46.2 %, respectively. Among those surveyed daily measure blood pressure 18.8 %, 1 time per week - 25.2 % 2 times a month - 25.8 % and 1 per month 30,2 % of the population.Causes of drug treatment admission were (%): forgot - 64.8, nothing bothered - 54.6, fear of side effects - 26.7, do not have the money for drugs - 14.7; do not find effective drugs - 12.3; afraid of getting used to - 10.4, lack of medicines at the pharmacy - 6.2; medicine is not pleasant to the taste smell - 4.3.

Conclusions: The percentage reduction in the number of strokes in 2013 compared with 2012 was 6.4 %. On average in Ukraine, the number of patients applied to physicians about hypertension and received medication for the pilot project is 74 % of patients with hypertension.

PP.38.37 EVALUATION OF QUALITY OF LIFE AND MEDICATION ADHERENCE OF A COMMUNITY-BASED HYPERTENSION MODEL PROGRAM IN THE PHILIPPINES

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Objective: Hypertension (HTN) is considered as the biggest single risk factor for deaths worldwide. The prevalence of hypertension in the Philippines has been increasing from 1992 to 2003 due to poor blood pressure (BP) control. Recent studies suggest involving pharmacists with their knowledge and experience is an effective strategy for improving adherence and BP control.
To evaluate the medication adherence and quality of life focusing on BP monitoring and lifestyle modification of patients in the pharmacist-led hypertension program in an urban resource limited community in Valenzuela City, Philippines.

Design and method: An approach model of tailored intervention for a community-based hypertension program was conceptualized. Five different phases (patient profiling and medication adherence, nutrition, exercise, post intervention and post monitoring) were implemented. Vital signs such as respiratory rate, pulse rate, BP, height, weight and vision were measured. Short Form-12 was used to evaluate general physical, social, and psychological health. Morisky scale was used to assess medication adherence.

Results: Based on the baseline BP during the first visit in 2012 (n=51), 32.69%, 30.77%, 21.15% and 15.38% were normal, pre-hypertensive, hypertension stage I, and stage II, respectively. After the program, only 60% (n=30) finished the program, in which 56.67% (n=17) has decreased BP, 16.67% (n=5) maintained their BP, 26.67% (n=8) has increased BP. Determination of the quality of life revealed an increase in the general well-being of the patients. Adherence to medication was also increased.

Conclusions: The community-based pharmacist-led hypertension model program was beneficial in improving medication adherence and reducing BP. Pharmacists can effectually contribute in health education and promotion to improve BP control.

PP.38.38 HEALTH EDUCATION PROJECT BETWEEN SCHOOL AND FAMILY: THE HEART AT… SCHOOL

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Objective: Cardiovascular diseases is the leading cause of mortality. Therefore plays an important role in the early detection of risk factors and lifestyle education and correction since school age.
The Health Education School Project is open to the whole family and designed to assess the level of knowledge of children and parents toward the risk factors in order to correct them with health education intervention.

Design and method: Enrolled the first classes of high schools Moscati, Pertini and Calo of Grottaglie (Italy): 433 young people and 866 parents were given questionnaires and performed health education lectures.

Results: Young people: 306 (111 M, 195 F, average age 14 years), 19% overweight and 5% underweight. 60 % > 2-5 hours a TV/PC. 44% does not exercise, and 60 % does not consume fruit and 90% vegetables. 50% consume red meat and only 4% fish. 54% eat sweets, 19% drink alcohol 2-3 times/week, 13% smokers (6 cigarettes/day). Parents: 602 parents with average age 45±6 years. BMI > 26 (M 40%, F 30%). 35% > 2 risk factors (hypertension 50%, diabetes 10%, hyperlipidemia 40%), only 22% has no risk factors, while 43% declared one. Mean BP of 120/75±26 mmHg and only 10% controls the BP once a week; in therapy (M 85%, F 77%). 18% smokers (15 cigarettes/day). 72% consumed < 2 times/week vegetables and 40% does not take the fruit. The 2% eat meat every day and 98% a few times/week, while only 1% eat fish every day and 99% < 3 times/week. 35% drink alcohol. 52 % > 2-5 hours a TV/PC.

Conclusions: The data show that the health of the young people considered in the study reflects an unhealthy lifestyle and that the risk factors start since adolescence affecting the risk of obesity and cardiovascular disease and behavioral disorders. The data analysis showed that the risk factors and improper lifestyles are very common in an adult population of ages < 50 years. All this induce this cohort to the occurrence of adverse prognostic events, but above all are a bad example to their children.

PP.38.39 THE BLOOD PRESSURE RECORDING CARD: A USEFUL TOOL FOR PARTICIPATORY MANAGEMENT OF HYPERTENSION IN A DEVELOPING COUNTRY SETTING

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Objective: The patients' understanding of hypertension and its treatment process is crucial for a successful outcome. The usual doctor – top and patient-down approach has contributed to a large extent in the poor control of blood pressure and other risk factors in the hypertension clinic. This is more profound in developing countries where conceptual differences exist regarding hypertension. The objective of this paper is to present a tool which when used could assist in demystifying the processes of diagnosis and treatment of hypertension in a participatory manner.

Design and method: The blood pressure card was designed to incorporate the patient's demographics, a crest identifying the organs affected, recommended life style measures, a chart for serial documentation of pulse, blood pressure and other measures of cardiovascular risk factors. Provision is also made for the documentation of therapy and adverse drug reactions.

Results: The potential uses of this tool for participatory decision making, initiation of treatment, identification of poor adherence to therapy and other issues regarding management is highlighted. The utility of the BP card when a patient is out of station and information is required by a new physician is underscored. The pictorial illustrations is of immense educational value regarding the patients' awareness of the disease burden, its potential complications and the treatment of hypertension.

Conclusions: The BP recording card if properly applied is a useful tool for assisting patients to achieve blood pressure control in developing countries.

PP.38.40 THE ROLE OF NURSING IN PROMOTING AND ENCOURAGING PHYSICAL ACTIVITY: PROSPECTIVE STUDY WITH SEDENTARY HYPERTENSIVE PATIENTS FOLLOWED IN THE FAMILY HEALTH STRATEGY

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Objective: Evaluate the effect of physical activity and behavior change in sedentary hypertensives followed in the Family Health.

Design and method: A prospective/experimental study for 10 weeks in clinic in São Paulo. We studied 263 hypertensive patients (70.3% women 56.4±9.6 years, 57.4% non-white). Inactive as the International Physical Activity Questionnaire (IPAQ) were divided into G1/n130 , and G2/n133. Groups performed at the beginning and end of the study: assessment of the stage of behavior change by Prochaska Instrument, level of physical activity (IPAQ), casual measured by the nurse and home blood pressure measurement (HBPM) with automatic device validated, and measurement steps three days of using the pedometer. G2 received guidance from nursing to encourage habit change with physical activity-PA and use of the pedometer for ten consecutive weeks .

Results: G1 and G2, significantly reduced blood pressure ($p<0.05$), from the beginning to the end of the study, and G2 presented at the end of the study to lower diastolic pressure casual and HBPM ($p<0.05$) than the G1, and significant increase in the number of steps. The change in PA behavior was significant at the end of the study: 61% of the patients from G2 were active or very active vs 30.3% of the patients from G1; in G2 66.2 % were phase of preparation, action or maintenance vs 40% of G1. The steps was significant at the end of the study: 48.1% of G2 conducted between 6000 and 10000 steps vs 43.1% in G1. In G2 24.3% had >10000 steps vs 9.2% of G1. In blood pressure control was significantly associated at the end of the study: 80.8% of G2, controlled HMBP end, performed >6000 steps vs 62.8% of uncontrolled, in G1 were 51.8% vs 45% of controlled 7% of non-controlled. Regarding the G2 in the ten week intervention with the pedometer, those who underwent 6000 to 10000 steps were significantly more controlled only by HBPM.

Conclusions: The encouraging PA guidelines with the nurse plus the use of the pedometer proved extremely effective in changing the behavior of hypertensive patients followed at the Family Health.

PP.38.41 GROUP COUNSELING SESSIONS FOR HYPERTENSIVE PATIENTS

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Objective: Despite the considerable progress in the pharmaceutical field and the high number of antihypertensive drugs available, hypertension is one of the main risk factors for cerebral-cardiovascular accidents. The aim of this study was to evaluate the effectiveness of small group counseling sessions on blood pressure control.

Design and method: It was a randomized controlled trial carried out in the Centre for the Diagnosis and Therapy of Arterial Hypertension of Cardarelli Hospital, Naples, Italy. Recruitment period lasted 3 months. Patients agreed to participate into the study, signed an informed consent and were randomly assigned to Controlo group (Group C), which receive routine care, ad Intervention group (Group I9 which receive the intervention. The intervention consisted of 12 small group (10-12 patients) counselling session held every week and lasting 2 hours. The sessions addressed how to improve patients' self-esteem and self control over the disease and treatment; beliefs about medicines, medical and social support, patients' relationship with their health care provider, adverse effects of medication therapy, weight management, exercise, diet, smoking, and alcohol use.

Results: A total of 62 patients were recruited (33 Group I; 29 Group C). After one year there was a significant reduction of blood pressure for Group I ($p<0.001$) and a significant reduction only for systolic blood pressure in Group C ($p =0.002$).

Conclusions: According to these preliminary data, small group counseling sessions are effective in improving blood pressure control as they offer participants the opportunity to learn from each other and receive mutual support. These findings show that a multidisciplinary approach is needed to take care of chronic conditions such as hypertension , and counseling abilities should be implemented for all team members. These data must be confirmed on a larger sample.

PP.38.42 A TEN YEARS LONGER LIFE: A THERAPEUTIC EDUCATION PROGRAM FOR HYPERTENSIVE PATIENTS

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Objective: In 2007 the Work Group of Cardarelli Hospital (Naples) developed a therapeutic education program to reduce blood pressure (BP) in patients with hypertension through a better adherence to pharmacological and non pharmacological treatment. The program was funded by a grant from Italian Agency of Drugs (AIFA).

Design and method: It was a randomized controlled study including hypertensives (SBP>135 mmHg and DBP>85 mmHg) 18 years of age or older. Patients were enrolled by the Hypertension Unit of Cardarelli Hospital and were randomly assigned to Control group (C) and Intervention group (I). Group I, in addition to the routine care, received a Patient Information Leaflet giving information on hypertension and participated to three educational group sessions (designed according to the focus group and role playing methods), respectively at 2,4 and 9 months after the recruitment. Group C received the routine care. Both groups received a control visit at 2, 4 and 9 months after the recruitment.
The primary outcomes were the change in BP values and the achievement of BP target. BP measurements were assessed according to the ESH guidelines. Information on patients' demographics, co-morbidity and drugs were collected at baseline and at 12-month-follow-up.

Results: We randomized 861 patients were (365 in the Group C and 496 in the Group I). There were no significant differences ($P>0.05$) in both groups concerning age and gender. At the 12-month follow-up, 17.29% (32/184) in the Group I were within their assigned target and 23.36% (25/107) of the subjects in the Group C achieved the blood pressure target (absolute difference control – treatment : 6,07%). The unadjusted odds ratio however was not significant ($p>0,05$), in the multivariate regression analysis, after adjusting for confounding variables, subjects in the Group I were significantly more likely to be in target at 12 months than those in the Group C: adjusted odds ratio: 3.07 (95% C.I., 1.36 ; 6.91).

Conclusions: Our findings show that a patient-oriented approach is a powerful tool for reaching better blood pressure control and underlying the essential role of patients involvement in the management of their care.

POSTERS' SESSION

POSTERS' SESSION PS39
ENDOCRINE HYPERTENSION

PP.39.01 HEMORRHAGE OR RUPTURE AS COMPLICATIONS OF PHEOCHROMOCYTOMA OR FUNCTIONAL PARAGANGLIOMA

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Objective: Pheochromocytomas or functional paragangliomas may present not only with complications related to the catecholamine excess but also with local complications such hemorrhage or oven tumor rupture.

Design and method: We report about two case reports of subjects with pheochromocytoma or functional paraganglioma with local live-threatening complications

Results: First patient: Thirty five years old female had been treated for labile hypertension associated with paroxysmal headache, sweating and vomiting. Hypertension treatment was stopped six months before admission when symptoms disappeared. One month before admission, the patient started to complain of back pain, sweating and anxiety. Very intense lumbago with profuse sweating and without reaction to pain medicine led the patient to the emergency department in the local hospital. Here was found labile blood pressure with very quick fluctuations from hypotension to severe hypertension, hyperglycemia and leukocytosis. Urgent CT showed then large mass in the left adrenal gland with suspected hemorrhage. The patient was transferred to our hospital with suspected pheochromocytoma. After institution of treatment with doxazosin, the patient's condition stabilized. Laparoscopic adrenalectomy was performed the tenth day after admission without any complications. Laboratory examination showed increased levels of plasma metanephrines. Diagnosis of pheochromocytoma with extensive hemorrhage was confirmed on histopathology.
Second patient: Thirty nine years old male had been investigated for paroxysmal headache associated with blood pressure elevations, sweating, palpitations and chest pain without any conclusion. Patient's condition deteriorated rapidly after returning from the nightshift when the patient started to complain of severe headache with subsequent intense pain in the abdomen. After syncope, the patient was transferred to the local hospital. Urgently performed CT examination showed a large hematoma (20x15 cm) in the left renal region and the unconscious patient was immediately transferred to the operation room where nephrectomy, adrenalectomy, and tumor resection were performed. After the operation, the patient improved rapidly and paroxysmal symptoms disappeared. On histopathology, paraganglioma was found.

Conclusions: Beside typical cardiovascular complication of pheochromocytoma or functional paraganglioma due to catecholamine excess, the course of these tumors may be also threatened with local complications such as hemorrhage into the tumor or even tumor rupture.

PP.39.02 RS3740835 VARIANT IN KCNJ5 GENE RELATED TO THE CT SCAN-BASED ADRENAL HYPERPLASIA IN PATIENTS WITH PRIMARY ALDOSTERONISM

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Objective: As a novel candidate gene contributing to primary aldosteronism(PA), KCNJ5 gene is believed to play roles in adrenal hyperplasia. The present study aims to explore the association of variants in KCNJ5 gene with CT scan-based adrenal hyperplasia in patients with PA from Xinjiang.

Design and method: Followed the guideline of PA in 2008, a protocol for PA screening and diagnosis was performed in Center of hypertension in Xinjiang from 2008 to 2010. Finally,457 cases of subjects with confirmed PA were enrolled and were divided into adrenal hyperplasia group and control group according to the findings of thin-section CT scan. The blood samples were collected for DNA extraction and genotype identification.

Results: (1) The average level of plasma potassium in patients with adrenal hyperplasia was (3.63±0.42) mmol/L, which was significantly lower than that in controls(3.76±0.37) mmol/L with P=0.001. But the baseline plasma aldostrone level(22.78±26.52)ng/dl, urine potassium excretion (46.02±22.47) mmol/L in the adrenal hyperplasia group was higher than those in controls, which was (18.13±7.60)ng/dl, P=0.032) and (42.37±15.66) mmol/L,P=0.080). The age, mean blood pressure, body mass index, plasma sodium,urine sodium excretion as well as plasma rennin activity were matched. (2) 41.3% subjects were diagnosed as obstructive sleep apnea syndrome, 75.7% patients had hypertension history and 33.0% patients had hypokalemia history. Further, more patients with adrenal hyperplasia had hypokalemia history than that without adrenal hyperplasia (39.2% vs. 20.7%, P<0.001). The frequency of CC genotype of rs3740835 in KCNJ5 gene was higher in control group rather than that in adrenal hyperplasia group (67.7% vs.58.2%, P=0.047), though the significance only reached the boardline. (3) Logistic regression model was constructed to explore the potential factors that related to CT scan-based adrenal hyperplasia in whole study population. The results showed that the rs3740835 in KCNJ5 gene [0.642 (0.424-0.971), P=0.036] as well as plasma potassium[0.432(0.261-0.715), P=0.01] played protective roles in adrenal hyperplasia, adjusted for body mass index, gender, age.

Conclusions: The rs3740835 variants in KCNJ5 gene as well as plasma potassium levels were contributing factors to adrenal hyperplasia in patients with PA from Xinjiang.

PP.39.03 HIGH FREQUENCY OF ASC/TMS1, RASSF1A, AND P16INK4A PROMOTER METHYLATION IN SUCCINATE DEHYDROGENASE COMPLEX B AND D PHEOCHROMOCYTOMAS/PARAGANGLIOMAS

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Objective: Pheochromocytoma (PHEO) is tumor from chromaffin cells of the adrenal medulla or at extra-adrenal location - paraganglioma (PGL). The genetic basis for PHEO/PGL involves mutations of 11 genes, including SDHx (SDHB and SDHD). There is no reliable method to predict the metastatic potential of these tumors, and an answer may lie within DNA hypermethylated promoter sequences. DNA methylation is modification resulting in the addition of a methyl group at the carbon position of the CpG dinucleotides. We hypothesized hypermethylation is correlated with the more aggressive genotype, SDHx.

Design and method: In this study is sample set of 18 patients, 1 with VHL, 2 with MEN2A, 3 with SDHB, 2 with SDHD, 10 without any mutation (sporadic) and we examined the methylation status of 11 genes, which are frequently methylated in other cancers.
Analysis of promoter methylation: Sodium bisulfate modification of DNA was done with the EZ DNA methylation kit following the manufactturer's protocol. Methylation-specific PCR was done as described by Herman et. al. using primers specific for H-cadherin, ASC/TMS1, Rassf1A, p16/INK4A, HOXA9, APC, DAPK, POMC, FOX49, CDO1, and SOX17. Reaction products were separated by electrophoresis, stained with ethidium bromide and photographed.

Results: Of the patients of SDHx genotypes, 100% of tumors showed methylation in ASC/TMS1, Rassf1A, and p16. Sixty percent showed methylation for HOXA9, 40% for H-cadherin, 20% for POMC, 60% for NEFH. No tumors with MEN2A showed methylation in these genes. The VHL tumor showed methylation in Rassf1A.

Conclusions: However, evidence of hypermethylation of three genes (ASC/TMS1, p16, and Rassf1A) has now been observed within the same sample set of SDHx patients. Could they be diagnostic for SDHx PHEO/PGL and could hypermethylation be correlating with the more aggressive genotype (SDHx)? APC and CDO1, commonly methylated in other cancers, were not found to be methylated in our PHEO/PGL sample set. DNA hypermethylated promoter sequences are promising to be cancer markers and could be useful for prognosis or risk assessment, and early diagnosis.

PP.39.04 THE DIFFERENCE OF RELATIONSHIP BETWEEN SERUM ALDOSTERONE AND CENTRAL BLOOD PRESSURE IN ESSENTIAL HYPERTENSION AND PRIMARY ALDOSTERONISM

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Objective: Aldosterone is the fundamental hormone of renin-angiotensin-aldosterone system (RAS). Increasing RAS triggers not only raising blood pressure but various organ damages. However, it is difficult to evaluate tissue RAS. Especially, in primary aldosteronism patients (PA), regulation of RAS is fallen apart, and serum RAS is not always reflected tissue RAS. Recently, it is suggested that central blood pressure (CBP), directly put pressure on principal organ such as heart, can be a guide to predictor of cardiovascular events independent of brachial systolic blood pressure (SBP). In this study, we evaluate whether CBP is given to the impact by the difference of RAS activity in essential hypertension patients (EH), and whether CBP of EH is different from that of PA.

Design and method: In this study, 33 EH and 17 PA were intended. Plasma renin activity (PRA), plasma aldosterone concentration (PAC) and CBP were measured in EH who are untreated and receiving antihypertensive agents. In PA, PRA, PAC and CBP were measured at the time before and after treatment that receive eplerenone or adrenorectomy. CBP was measured using the HEM-9000AI an automated tonometer.

Results: The gap between CBP and SBP (CBP-SBP) demonstrated a tendency to be widened with increasing PAC in EH. In contrast, CBP-SBP demonstrated an adverse tendency in PA.
PA had not significant difference of SBP and CBP compared with EH, however CBP-SBP was significantly-higher with PA than EH. Increasing CBP-SBP suppressed with the treatment of adrenorectomy or medication of eplerenone.

Conclusions: It is suggested that even the slightly change of PAC, which does not occur the feedback of renin secretion, has a potential to affect CBP. Furthermore, it is also suggested that the mechanism, which is independent of serum RAS such as tissue RAS, has a potential to affect increasing CBP when the regulation of RAS is fallen apart by the oversecretion of aldosterone in PA. From this study and ASCOT-CAFÉ study, even if SBP is controlled adequate, CBP is indicated different tendency because of increasing RAS, and causes cardiovascular events higher.

PP.39.05 RENINOMA: A RARE CAUSE OF CURABLE SECONDARY ENDOCRINE HYPERTENSION

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Objective: Reninoma is a tumor arising from juxtaglomerular apparatus of kidneys, which overproduces renin leading to secondary aldosteronism, causing hypokalemia and arterial hypertension. It is a very rare disease with only tens of reported cases thorough the world.

Design and method: This is a case report concerning a 28 years old female patient which was referred to our hypertension unit by GP due to severe hypertension (BP before treatment 210/140mmHg). Hypertension was diagnosed in 2010 when patient complained of headaches, later screening of secondary hypertension at the local level revealed secondary aldosteronism.

Results: First MRI excluded renal artery stenosis in 2010. Two years later, recent MRI of adrenal glands and kidneys revealed susprisingly an ovoid intraparenchymal renal tumor 25x30mm in the lower part of the right kidney. Our laboratory testing confirmed secondary aldosteronism (supine aldosterone 318,7 ng/l, upright aldosterone 962,9 ng/l,) with an excessive (10-13 times over upper limit) increase of direct renin concentration (supine renin: 511,4 pg/ml, upright renin 496,6 pg/ml). Therefore a possible renin-producing tumour was also suspected. The patient was indicated to surgery, performed at the Department of Urology – attempt to enucleate the tumor was successful. The function and structure of the right kidney was preserved. Histological examination confirmed the clinical suspicion with diagnosis of a tumor arising from juxtaglomerular apparatus - consisting of polygonal cells with eosinophilic cytoplasm - a reninoma.
The endocrine check-up after surgery confirmed good effect of nephron-sparig surgery with preservation of function of the affected right kidney. Plasma renin, aldosterone and kalemia concentrations normalized together with normalization of blood pressure. There was no need for antihypertensive treatment anymore.

Conclusions: In conclusion, though reninoma is a rare disease, it is a well curable form of secondary endocrine hypertension. Therefore it has to be suspected in all patients with hypertension, hypokalemia with picture of secondary aldosteronism and excessive elevation of direct renin/plasma renin activity.

PP.39.06 SALINE SUPPRESSION TESTING PERFORMED IN SEATED PATIENTS IS SUPERIOR TO RECUMBENT AND COMPARABLE TO FLUDROCORTISONE SUPPRESSION TESTING IN DIAGNOSING PRIMARY ALDOSTERONISM

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Objective: Demonstrating aldosterone production which is relatively autonomous of its normal chronic regulator, angiotensin II, confirms primary aldosteronism (PA). This is done by demonstrating lack of aldosterone suppression when plasma renin has been suppressed by sodium loading manoeuvers such as fludrocortisone suppression testing (FST) and saline suppression testing (SST). We have previously found recumbent SST to lack sensitivity.

Design and method: Of 65 patients who underwent FST (plasma aldosterone measured at 10am after 2-3h upright posture basally and after 4 days administration of fludrocortisone 0.1mg 6 hourly and oral salt loading) between April 2012 and November 2013, 31 agreed to participate in the study and underwent SST (aldosterone measured basally at 8am and at completion of an infusion of 2L normal saline over 4 h) both (1) recumbent (infusion commenced 30min after assuming recumbency) and (2) seated, with SSTs spaced at least 2 weeks apart, and in randomised order.

Results: FST confirmed PA (day 4 upright aldosterone >165 pmol/L) in 24 of 31 patients (10 were posture-unresponsive ("U") and 14 were responsive ("R"), excluded PA in 3 and was inconclusive in 5 (one of whom subsequently lateralised on adrenal venous sampling, confirming PA). Of the 24 with confirmed PA (8 unilateral, 11 bilateral and 5 undetermined subtype), 23 tested positive (plasma aldosterone >165 pmol/L at 4h) by seated SST. Recumbent SST was positive (plasma aldosterone >140 pmol/L at 4h) in only 7 of the 24, missing one with unilateral, all 11 bilateral and 4 with undetermined subtype of PA. All 3 patients without PA (FST negative) tested negative by seated and recumbent SST. Seated SST was positive for all 10 "U" (100%) and for 13 of 14 "R" (92.9%). Recumbent SST was positive in 7 of the 10 "U" (70%) and only 1 of the 14 "R" (7.1%). The difference in these positive percentages was highly significant ($P < 0.005$).

Conclusions: Seated SST is superior to recumbent SST in detecting PA, especially in patients with posture-responsive forms, and may be a reliable alternative to FST.

PP.39.07 INFLAMMATORY MARKERS IN PRIMARY ALDOSTERONISM

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Objective: Primary aldosteronism (PA) characterized by an autonomous overproduction of aldosterone is the most common cause of endocrine hypertension with a high frequency of cardiovascular complications. The unfavorable cardiometabolic profile may be due to aldosterone-mediated activation of inflammatory cells, circulatory cytokines and activation of collagen synthesis in the vessel wall.

Design and method: Aim of our study was to evaluate differences in the levels of hsCRP, IL-6, TNF-α and the N-terminal propeptide of collagen I (PINP) in patients with PA and essential hypertension (EH) and between the most common subtypes of PA- aldosterone producing adenoma (APA) vs. idiopathic hyperaldosteronism (IHA). We studied 28 patients with PA and 29 matched patients with EH. From the PA group 10 patients had IHA and 12 patients APA, 6 remained unclassified. Criteria for subtype specification were selective adrenal venous sampling or adrenalectomy with histological verification of the adenoma and normalization of hormonal parameters afterwards.

Results: There were no differences in the levels of inflammatory markers between EH and PA [TNF-α (5.51±0.43 vs. 5.82±0.66), IL-6 (0.89±0.06 vs. 1.19±0.15), hsCRP (1.13±0.25 vs. 0.68±0.17), leukocytes (6.35±1.56 vs. 6.01±1.26)] and between APA and IHA [TNF-α (5.22±0.69 vs. 4.9±0.38), IL-6 (1.02±0.18 vs. 0.96±0.14), hsCRP (0.41±0.06 vs. 1.17±0.42), leukocytes

(6.37±1.41 vs. 5.71±1.21)]. Basal cortisol levels were not statistically different between PA and EH patients but were significantly different among patients with APA and IHA (435.3±28.3 vs. 615.4±40.5, p<= 0.002), no differences in urine cortisol or short dexametasone test were found. Significant differences were in the levels of PINP between PA and EH (53.03±30.89 vs. 35.77±12.34, p<= 0.007); there were no significant differences in PINP levels between APA and IHA.

Table 1		EH		PA	p
Variable	n		n		
Leukocytes, 10^9/l	29	6.35 ± 1.56	28	6.01 ± 1.26	NS
Neutrophils, 10^9/l	29	3.57 ± 1.25	28	3.55 ± 1.03	NS
Lymphocytes, 10^9/l	29	1.99 ± 0.57	28	1.77 ± 0.45	NS
Monocytes, 10^9/l	29	0.54 ± 0.15	28	0.47 ± 0.13	NS
hsCRP, mg/l	29	1.13 ± 0.25	28	0.68 ± 0.17	NS
IL-6, pg/ml	29	0.89 ± 0.06	28	1.19 ± 0.15	NS
TNF-α, pg/ml	29	5.51 ± 0.43	27	5.82 ± 0.66	NS
PINP, ng/l	29	35.77 ± 12.34	28	53.03 ± 30.89	0.007
Basal cortisol levels, nmol/l	29	553.9 ± 151.2	25	506.7 ± 154.1	NS

Table 2		APA		IHA	p
Variable	n		n		
Leukocytes, 10^9/l	12	6.37 ± 1.41	10	5.71 ± 1.21	NS
Neutrophils, 10^9/l	12	3.78 ± 0.98	10	3.31 ± 1.2	NS
Lymphocytes, 10^9/l	12	1.83 ± 0.51	10	1.79 ± 0.47	NS
Monocytes, 10^9/l	12	0.47 ± 0.14	10	0.48 ± 0.14	NS
hsCRP, mg/l	12	0.41 ± 0.06	10	1.17 ± 0.42	NS
IL-6, pg/ml	12	1.02 ± 0.18	10	0.96 ± 0.14	NS
TNF-α, pg/ml	12	5.22 ± 0.69	9	4.9 ± 0.38	NS
PINP, ng/l	12	58.23 ± 12.35	10	52.61 ± 6.16	NS
Basal cortisol levels, nmol/l	11	435.3 ± 28.3	8	615.4 ± 40.5	0.002

Conclusions: We did not find any differences in circulating levels of inflammatory markers (TNF-α, IL-6, hsCRP and leukocytes) between EH and PA but we observed higher levels of N-terminal propeptide of collagen I in patients with PA. The subgroups of PA do not differ in levels of inflammatory markers or PINP, but patients with IHA have significantly higher levels of basal morning cortisol.

PP.39.08 ATTENUATION OF GENE EXPRESSION OF G PROTEIN-COUPLED ESTROGEN RECEPTOR 1 (GPER1) IN PERIPHERAL BLOOD MONONUCLEAR CELLS FROM POSTMENOPAUSAL PATIENTS WITH HYPERTENSION

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Objective: We tested the hypothesis that the possible changes in relative gene expression of G protein-coupled estrogen receptor 1 (GPER1) in peripheral blood mononuclear cells (PBMC) may be important in pathogenesis and treatment of patients with hypertension in late postmenopausal period.

Design and method: This study evaluated the level of GPER1 relative gene expression in peripheral blood mononuclearcells (PBMC) of 71 postmenopausal patients with hypertension and 31 women without hypertension as a control by real-timePCR. The ages of the patients were from 60 to 83, with the average 69±1 year. The blood samples were taken from medium cubital vein. The PBMC separation was down according by Boyum method of centrifugation on Ficoll gradient. The mRNA preparation from PBMC was down by using AmpliSens® Ribo-prepkit (Central Research Institute of Epidemiology, Russia).The cDNA was generated by using AmpliSens® Reverta-L. The RT-PCR was down on iCycler iQ5 real-time PCR with the Sybr Green qPCR Master Mix(BioRad, Germany) and specific primers (Sintol, Russia): GPER1: up - agggacaagctgaggctgta, low - gtctacacggcact-gctgaa. For estimation the mRNA copy number ΔCt-method was used ΔCt = Ct(gene) - Ct(GAPDH), data presented in 1/2^ΔCt.

Results: The development of hypertension is accompanied by decrease of relative gene expression of membrane associated estradiol receptor GPER1 in PBMC from patients in late postmenopausal period - 2.18 ± 0.33 vs control group - 4.99 ± 1.00(p = 0,005). This decrease (more than twice time) in GPER1 gene expression could be an indicator of profound alteration and could be more significant than attenuation of PR-A and ER-b receptor gene expression as we have shown before. Studies demonstrate direct effects of sex hormones on immunocompetent cells.

Conclusions: With the development of hypertension the steroidal control of the immune system and the endothelia function are changing. The impact of this change in pathogenesis of hypertension need to be further investigated. The level of GPER1 gen expression in PBMC from patients in late postmenopausal period could reflect severity of hypertension and serve as pathogenic ground for choosing appropriate treatment for patients with hypertension.

PP.39.09 MELATONIN SECRETION IN PATIENTS WITH BREAST CANCER ASSOCIATED WITH PRIMARY HYPERTENSION

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Objective: A number of experimental studies showed that melatonin, the main hormone of the pineal gland, exhibits chronobiological, anticancer and antihypertensive effects. It has been also known that endogenous lithium has similar chronobiological effect. The study was aimed to estimate melatonin secretion and serum levels of endogenous lithium in patients with breast cancer and concomitant primary arterial hypertension.

Design and method: A total of 18 patients (aged from 37 to 64 years) with breast cancer and concomitant primary arterial hypertension (stage I by Joint National Committee) were studied. Control group was represented by 16 patients (aged from 34 to 69 years) with the same stage of breast cancer. Plasma levels of melatonin were estimated by liquid chromatography, serum levels of endogenous lithium were determined by atomic absorption spectroscopy.

Results: Our results showed that plasma melatonin levels in patients with concomitant hypertension was almost 20 times lower (0.11 ± 0.06 pcg/ml) than in control group (2.3 ± 0,38 pcg/ml, p<0,01). While serum level of endogenous lithium in patients from control group (0,8 ± 0,03 mmol/l) was within the normal range (0,5 - 1,2 mmol/l), its serum level in patients with both cancer and hypertension was about ten times lower (0,07 ± 0,03 mmol/l, p<0,001).

Conclusions: Melatonin plasma levels and serum concentration of endogenous lithium significantly decrease in patients with breast cancer and arterial hypertension. Taking into consideration that both melatonin and endogenous lithium are chronobiologically active substances, we suggest that disturbances in circadian rhythm might contribute to the pathogenesis of arterial hypertension in patients with breast cancer.

PP.39.10 SYMPATHETIC AND METABOLIC EFFECTS OF SURGICAL REMOVAL OF ADENOMAS IN ACROMEGALIC PATIENTS: MICRONEUROGRAPHIC EVIDENCE

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Objective: It has been previously shown that patients with early stage of acromegaly, not accompanied by organ damage, are characterized by a profound sympathoinhibition coupled with low leptin plasma levels. Whether the surgical removal of the adenoma is able to restore the adrenergic drive and correct the metabolic alterations is unknown.

Design and method: Sympathetic tone has been directly recorded to the skeletal muscle through the microneurographic technique (MSNA) in: a) 15 acromegalic patients (3 micro-, 12 macro-adenomas) in the early stage of this pathology (ACRO; age 46.6±10.3.0 years, media±SD) before and after surgery; b) 17 healthy subjects (C; age 49.1±15.6 yrs). The protocol included anthropometric, haemodynamic, echocardiographic, metabolic, humoral, blood pressure, and heart rate values before and after surgical removal of adenomas while in C data were collected only in basal conditions.

Results: Compared to C, ACRO were characterized by insulin resistance (HOMA: 1.57±0.3 vs 4.08±2.2 a.u., p<0.01) and by a significant reduction in plasma leptin (6.42±2.0 vs 1.62±1.0 µg/l, p<0.01) and MSNA (37.8±6. vs 17.7±7.7 bursts/min, p<0.01) values without any organ damage and significant changes on fat and muscle mass or water content assessed via electric impedance. After surgical removal of adenomas ACRO showed a normalization of IGF-1 and this was accompanied by a significant (p<0.01 for all) improvement in HOMA index (2.2±0.6 a.u.), in plasma leptin levels (6.0±2.6 µg/l) and in MSNA (30.1±3.2 bursts/min). No changes were observed in anthropometric, haemodynamic, echocardiographic, and electric impedance parameters. In the population as a whole we osserved a significant direct correlation between MSNA and plasma leptin levels (r=0.38, P<0.01) and an inverse correlation between leptin and IGF-1 (r=0.47, P<0.01).

Conclusions: The study shows for the first time that surgical removal of adenomas is able to almost completely normalize the MSNA and the metabolic altera-

tions associated with the increase in GH and IGF-1 levels. The study provides also additional evidence that in the early stage of the disease plasma leptin levels may have a major role in the sympathoinhibition more than reflex influences induced by changes in water content not present in this phase.

PP.39.11 RENAL SYMPATHETIC NERVE ACTIVITY MEDIATES ALTERED NA+ HANDLING AND HYPERTENSION SECONDARY TO NEONATAL HYPERLEPTINAEMIA

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Objective: Maternal obesity in rodents leads to sympathetic mediated hypertension in the juvenile offspring and hyperphagia and increased adiposity in adulthood. This is associated with an exaggerated leptin surge in early postnatal life. We have investigated the origin of hypertension in neonatal hyperleptinaemic mice, including the mechanisms that lead to dysfunctions of the kidneys.

Design and method: Wistar rats were injected with leptin (L-Tx, 3 mg/kg, ip) twice daily at postnatal day (PD) 9-14, to mimic the exaggerated leptin surge in neonatal offspring of obese dams, versus saline treated (S-Tx). At 30 days of age, rats were subjected to telemetry surgery and after 7 days of baseline recordings divided into (1) a renal denervation (RD) group and (2) a sham operation group (SH) to examine the effects of RD on blood pressure, heart rate, renal function (creatinine clearance), and tissue analysis of renal sodium retention markers. Bilateral renal denervation was performed in anesthesised rats. Kidney was exposed using a retractor and renal nerves were cut and painted with 10% phenol. Renal denervation was then confirmed by measure renal tissue norepinephrine content (< 10% of SH group). Renal tyrosine hydroxylase (TH), expression of AT1aR (type -1a ang II receptors), AT2R (type -2 ang II receptors), ACE (angiotensin converting enzyme), NHE3 (Na-H exchanger 3), and NCC (Na-Cl cotransporter) were examined.

Results: At 30 days of age, neonatal leptin rats demonstrated increased blood pressure, renal angiotensin system and sodium retention with decreased creatinine clearance [GFR, ml/min/kg, L-Tx, 2.8±0.1 vs. S-Tx, 3.5±0.2, n=6, $p<0.05$]. Seven days after renal denervation (RD) L-Tx rats showed reduced blood pressure compared to sham operated [night MAP, mmHg L-Tx-RD, 102±1.3 vs L-Tx-SH, 120± 2.5, n=6, $p<0.05$) with normalised NHE3 mRNA expression and improved the renal function.

Conclusions: Renal denervation seems to be a useful therapeutic strategy to improve the sodium handling in the kidney which reset the tubular functions in neonatal leptin mice which may underpin the development of hypertension and renal dysfunction.

PP.39.12 RELATIONSHIP BETWEEN BIOCHEMICAL PROFILE OF PHEOCHROMOCYTOMA, BLOOD PRESSURE PROFILE AND LEFT VENTRICULAR STRUCTURE AND FUNCTION. PMT-CARDIO

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Objective: To evaluate the relationship between biochemical profile of pheochromocytoma, blood pressure profile and left ventricular structure and function.

Design and method: In an ongoing PMT-Cardio program we evaluated 56 patients with pheochromocytoma (mean age 48±14 years, 29 F, 27 M) and 30 age, gender, BMI and office blood pressure levels matched patients with essential hypertension (HTN) (mean age 45±13, 15 F 15 M). In all patients evaluation of plasma free normetanephrine (NMN) and metanephrine (MN) concentrations by LC-MS/MS was performed. Patients with pheochromocytoma were divided into 2 groups: 22 patients with a predominantly norepinephrine-producing tumor (group NE) and 34 patients with a predominantly epinephrine-producing tumor (group EPI). 24-h ambulatory blood pressure (ABP) monitoring was performed. Nighttime BP decline was calculated and expressed as percentage. Echocardiography and tissue Doppler imaging were used to assess the following cardiac parameters: left ventricular hypertrophy (LVH), concentric remodeling (RWT>0,45), E' velocity, E/E' index and global longitudinal strain (GLS).

Results: There was no difference in daytime ABP levels between the groups. Patients in the group NE were characterized by higher nighttime systolic and diastolic ABP levels as compared both with patients in the EPI and HTN groups. Patients in the NE group were characterized also by less pronounced nighttime systolic and diastolic ABP decline as compared with EPI and HTN groups (-5/-9% vs -7/-14% and -11/-15% for systolic and diastolic ABP respectively; p=0.089/p=0.034 and p=0.015/p=0.015). Plasma free NMN significantly correlated with nighttime ABP levels. Patients in the EPI group were characterized by higher frequency of LVH and concentric remodeling (44,1 and 50%) as compared with NE (9,1 and 31,8%; p=0.005 and p=0.14) and HTN group (16.7 and 30%; p=0.018 and p=0.085). There was a tendency towards lower GLS and E' velocity in the group EPI as compared with HTN group.

Conclusions: Our preliminary results show that the biochemical profile of pheochromocytoma might affect blood pressure profile and left ventricular structure.

PP.39.13 A RARE CAUSE OF SEVERE HYPERTENSION IN THE TWENTIES: CASE REPORT

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Objective: We present a case of a 21-year old woman with no past medical history who was admitted to our private consultation with a recently, and incidentally, diagnosed severe hypertension [180/120 mmHg systolic/diastolic blood pressure].

Design and method: The patient presented with sinus tachycardia, headache and tremor. The laboratory investigation demonstrated both elevated plasma norepinephrine (1910 pg/ml) and epinephrine (1780 pg/ml) and 24h urinary free catecholamines (790 µg/24h).
Method: These data made the diagnosis of a catecholamine producing tumor highly probable. The complementary exams, such as the magnetic resonance imaging of the abdomen showed normal adrenal glands, but it also revealed a mass (3.6x3.1 cm) anterior to the inferior vena cava.

Results: As no scintigraphy exists in our island, the patient was sent to the mainland, where the diagnosis of paraganglioma was confirmed by meta- iodobenzylguanidine scintigraphy. After a prompt admission the patient started on preoperatively, α- and β-adrenergic receptor blocker. The resection of the tumor occurred with uneventful episodes and soon after the patient's blood pressure was restored to normal. The three month follow up revealed a stable blood pressure with a plasma and 24h urinary catecholamine levels close to normal.

Conclusions: In conclusion, in a young patient the measure of blood pressure should take place in early twentie's and if high possible causes for secondary hypertension must be ruled out. The paragangliomas are a rare but possible cause of secondary hypertension and need to be thought of, diagnosed and treated as described above, since surgical removal of the tumor, especially in sporadic cases, may cure the patient.

PP.39.14 PRIMARY ALDOSTERONISM AND HYPERPARATHYROIDISM: THEY DO COEXIST!

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Objective: Different disorders of endocrine system may coexist in some syndromes like MEN1 and MEN2. In some cases the coexistence of glands disorders cannot be classified in any syndrome. Primary aldosteronism and hyperparathyroidism have been rarely diagnosed in patients simultaneously.

Design and method: Motivated by this, we present the rare case of a 47 year old man with no family history, who presented in our Clinical Outpatient Centre with dysregulated blood pressure (182/120 mmHg). He has been suffering from hypertension for 16 years and has been treated with a-blocker, calcium blocker and nitrates.

Results: Blood tests revealed hypokalaemia, hypercalcaemia, normal phosphorus levels, third degree renal failure (GFR: 45.4 ml/min/1.73m2) and anemia (attributed to renal failure). U waves were noted in V2 to V4 ECG leads. A computed tomography scan evidenced a 5.5 mm diameter adrenocortical nodule. Plasma aldosterone concentration was elevated (23.8 ng/dl), plasma renin activity was suppressed (0.26 ng/ml/h) and aldosterone–renin ratio was markedly elevated (91.5). Saline loading and Fludrocortisone suppression test led to the diagnosis of primary aldosteronism (cortisol and dehydroepiandrosterone

were in normal rates). In the beginning spironolactone was prescribed resulting in a significant fall of blood pressure.
The intact parathyroid hormone was very high (295 pg/ml). Cervical MRI scan was normal but a Tc-Sestamibi scan revealed a nodule of parathyroid, which was surgically excised. After the operation a further fall of blood pressure was noted.

Conclusions: Hence, we must keep in mind the possibility of coexistence of primary aldosteronism and hyperparathyroidism in patients with high blood pressure, hypokalaemia and hypercalcaemia. The majority of experimental animal and clinical studies support a clinically relevant interplay between aldosterone and parathormone levels. Much must be learned between these two hormones and receptors in target tissues in order to prevent the vicious circle between them and consecutive cardiovascular damage.

PP.39.15 LONG-TERM CARDIO- AND CEREBROVASCULAR EVENTS IN PATIENTS WITH PRIMARY ALDOSTERONISM

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Objective: Aldosterone producing adenoma (APA) and bilateral adrenal hyperplasia (BAH) are the two most common subtypes of primary aldosteronism (PA). PA patients display an increased risk of organ damage compared to essential hypertensives (EH) with similar blood pressure and risk profiles.

Design and method: We retrospectively compared the percentage of patients experiencing events at baseline and during a median follow-up of 12 years in 270 PA patients case-control matched 1:3 with EH patients and in PA subtypes vs matched EH.

Results: During the total period of follow up 22.6% of PA patients experienced events, compared to 12.7% of EH. At diagnosis of PA a higher number of patients had experienced events compared to EH (14.1% vs 8.4%), and also during the follow-up period (8.5% vs 4.3%). The analysis of event subtypes showed an increased prevalence of arrhythmias, stroke and HF during the total period of the study. Interestingly, during the follow-up after diagnosis of PA, only HF was more frequent in PA compared to EH. Moreover, during the follow up period, a higher percentage of PA patients developed type II diabetes mellitus compared to matched EH. Age, duration of hypertension, systolic blood pressure, presence of diabetes mellitus and PA diagnosis were independently associated with the occurrence of all events. Patients with APA displayed a higher rate of events compared to BAH patients both in the total period of the study and at diagnosis of PA, but not during the follow- up after diagnosis. A significantly higher number of APA patients had a cardiovascular event during the study and at diagnosis of PA but not during the follow-up period subsequent to PA diagnosis. BAH patients displayed a higher rate of events during the study period compared to EH, but this difference was predominantly due to an increased rate of events during the follow-up after the diagnosis of PA compared to the rate of events at diagnosis.

Conclusions: This study demonstrate the pathogenetic role of aldosterone excess in the cardiovascular system and thus the importance of early diagnosis and targeted PA treatment.

PP.39.16 CHANGES OF CARDIOVASCULAR DISEASE PARAMETERS IN PATIENTS WITH ACROMEGARY AFTER TRANSSPHENODIAL SURGERY

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Objective: Several studies have reported that patients with acromegaly have increased risk of cardiovascular disease (CVD), resulting from multiple cardiovascular risk factors. It has been reported that various laboratory parameters of CVD are associated with acromegary. However, there are few reports which compared many laboratory parameters of CVD on same acromegary patient before and after transsphenodial surgery (TSS). Purpose of this study is to investigate which laboratory parameter of CVD more correlates with acromegary patients before and after surgery.

Design and method: We performed a retrospective study to investigate the correlation between acromegary and various laboratory parameters of CVD. All 24 patients performed cardio-ankle vascular index (CAVI) and brachial-ankle pulse wave velocity (baPWV), which reflects arterial stiffness before and less than one year after surgery. Echocardiographic measurements and other biochemical parameters were also examined.

Results: Growth hormone (GH) ($p<0.0001$), insulin-like growth factor (IGF)-1 ($p<0.0001$), IGF-1 standard deviation score (SD) ($p<0.0001$), systolic blood pressure (SBP) ($P=0.0232$) diastolic blood pressure (DBP) ($P=0.0132$), the ratio of early diastolic mitral flow velocity to peak early diastolic mitral annular verocity (E/E') ($p=0.007$), hemoglobin A1c(HbA1c) ($p<0.0001$) and triglycerides(TG) ($p<0.0001$) decreased significantly after surgery. High density lipoprotein cholesterol (HDL) ($p=0.0006$) increased significantly after surgery. Instead of significant correlation between CAVI and baPWV, only CAVI levels increased significantly after surgery ($P=0.0232$). We also examined the correlation between changes of hormones and CVD parameters. Only changes of SD correlated with changes of baPWV. Changes of baPWV also correlated with changes of SBP, DBP and CAVI.

Conclusions: In this study, value of CAVI as well as GH, IGF-1, SD, SBP, DBP, E/E', HbA1c, TG and HDL changed significantly before and after TSS. CAVI was changed without relation to other parameters after surgery. Although both baPWV and CAVI are parameters of arterial stiffness, results of two analyses differed. baPWV may be easily affected by parameters of blood pressure. It is suggested that CAVI may be superior to baPWV as parameter of arterial stiffness in patients with acromegary after TSS.

PP.39.17 EFFECT OF AGE ON PRIMARY ALDOSTERONISM SCREENING

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Objective: The aldosterone/renin ratio (ARR) is the most reliable screening test for primary aldosteronism (PA), but false positives often occur in greater age. The purpose of this study is to investigate the effect of age on plasma renin activity(PRA), plasma aldosterone concentration(PAC) and ARR in PA identification.

Design and method: We recruited 230 in-patients with PA and 221 in-patients with essential hypertension(EH) of the center of hypertension in People's Hospital of Xinjiang. All subjects were asked to cease common antihypertensive medications which may affect the ARR at least 4 weeks before testing for ARR. We adopt midmorning seated sample for ARR testing and saline infusion as confirmatory test. Levels of PRA, PAC and ARR were compared at four ages range groups (age<40years, 40–49years,50–59years, and >or=60 years).

Results: (1) 45.2% patients was in 40-49 years old in PA group and 37.8% in EH group. Patients over 60 years were common in PA group (11.8%). (2) No significant difference of PRA, PAC and ARR was found in different age groups in patients with PA. (3)In patients older than 60 years, there was no significant difference of PRA between PA and EH group, but the level of aldosterone was significantly different. (4)In EH group, PRA of patients over 60 years old was significantly lower than that of patients under 40 years old ($P<0.01$). ARR of patients over 60 years old was significantly higher than patients under 40 years old and from 50 to 59 years old ($P<0.05$). (5) With advancing age, the screening accuracy of ARR was decreased, the optimal cutoff value of ARR in diagnosis for PA was increased. In the patients older than 60 years, the optimal cutoff value of ARR in diagnosis for PA was 40.0 calculated from ROC, area AUC was 0.88.

Conclusions: Our data suggest that an ARR >or= 40 strongly indicates PA in the patients older than 60 years. As a result of low rennin levels, the cutoff value of ARR in diagnosis for PA was increased with greater age, saline infusion as a confirmatory test is particularly important for this population.

PP.39.18 HYPERTENSION AND HYPOTHYROIDISM IN PATIENTS WITH METABOLIC SYNDROME

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Objective: The combination of a metabolic syndrome and hypothyroidism progressively increases risk development of cardiovascular diseases in patients with hypertension, abdominal obesity.

Design and method: 193 women who have made 2 clinical groups are surveyed: 1 group 95 patients (53,2± 1,8 years) with hypertension, abdominal obesity and hypothyroidism (TSH 11,5 ± 2,3 IU /ml, FT4 0,35 ±0,2 ng/ml); 2 group 98 patients (middle age 55,2± 2,1 years) with hypertension, abdominal obesity and euthyroid function (TSH 3,3 ± 0,5 IU/ml, FT4 0,8 ± 0,1 ng/ml). All researched carried out measurement waist circumference (WC), blood pressure

(BP) and the 24-hour BP monitoring, echocardiography, fast levels of glucose, insulin and lipids levels. Insulin sensitivity was estimated homeostasis model assessment (HOMA) method. The insulin resistance was diagnosed at increase of the HOMA>2,7.

Results: It is marked, that patients of 1 group had authentically , smaller displays of abdominal obesity (WC 112,3 ±2,7 sm) in comparison with 2 group (WC 93,2 ±2,2 sm) though parameters of bodymass index in both groups did not differ (34,9± 1,1 and 32,1 ±1,1 accordingly). In 1 group with diastolic hypertension (152/112mm Hg). In 2 group with hypertension (146/85mm Hg). In 1 group it has not been revealed changes of fast levels of glucose (5,5 ± 0,2 mmol/l) and attributes of the insulin resistance (HOMA 3,4± 0,3),that distinguished them from patients of 2 groups (HOMA 2,3 ± 0,2). Distinctive feature of 1 group was authentic higher in comparison to 2 group a parameter of the triglycerides (TG) levels (2,5 ±0,4 mmol/l).

Conclusions: It is established, that manifestation of metabolic syndrome in patients with hypertension, abdominal obesity and hypothyroidism it is accompanied with diastolic hypertension, by more expressed lipids disorders and changes of hemodynamic parameters of the left atrium and ventriculumr, but more favorable type of obesity and absence of impairments a carbohydrate metabolism.

PP.39.19 ADRENALECTOMY REVERSE THE IMPAIRED HEART RHYTHM COMPLEXITY IN PATIENTS WITH PRIMARY ALDOSTERONISM

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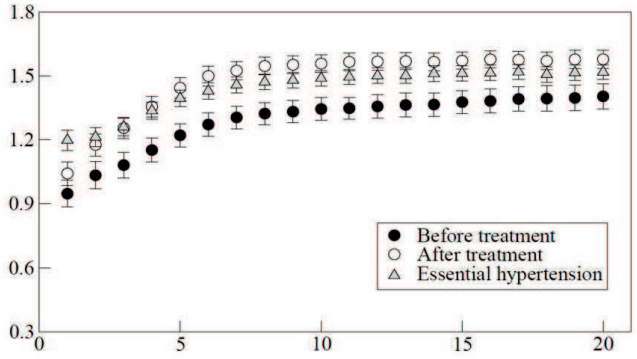
Objective: Primary aldosteronism (PA) is a common, curable hypertensive disease with a prevalence of 5-10% in hypertensive population. Compared to essential hypertensive (EH) patients, PA patients have higher prevalence of cardiovascular disease and arrhythmia. Heart rhythm complexity is a powerful tool in outcome prediction of patients with cardiovascular diseases. Our objective was to investigate heart rhythm complexity in PA patients and its change after surgery.

Design and method: We prospectively analyzed 20 patients with aldosterone producing adenoma (APA) that received adrenalectomy from December 2006 to October 2008, and 25 patients with essential hypertension (EH) were enrolled as the control group. Holter were performed in both groups and one year after operation in the APA group. Heart rhythm complexity including detrended fluctuation analysis (DFA) and multiscale entropy (MSE) were performed.

Results: APA patients had significantly decreased DFAα2 in DFA study; area 1-5, area 6-15, area 6-20 in MSE study (all $p< 0.05$). In correlation study, area 1-5, area 6-15, area 6-20 in MSE study were correlated significantly with log-transformed aldosterone concentration and log-transformed aldosterone-renin ratio. After adrenalectomy, all the altered parameters in MSE study and DFAα2 improved significantly (all $p<0.05$). The MSE studies of EH, APA before surgery, and APA after surgery were showed in figure 1.



Conclusions: Heart rhythm complexity is altered in APA patients and is reversed by adrenalectomy.

PP.39.20 HYPERFILTRATION IS ASSOCIATED WITH IMPAIRED RENAL FUNCTION AFTER TREATMENT OF PRIMARY ALDOSTERONISM

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Objective: Treatment of primary aldosteronism (PA) by adrenalectomy or spironolactone often results in a decline of renal function. This may be explained by reversal of hyperfiltration caused by PA. The goal of this study is to assess the risk factors associated with renal impairment after treatment of PA. In addition to factors suggested in the literature, we studied the influence of hyperfiltration in particular.

Design and method: We recorded retrospectively clinical characteristics and estimated GFR (eGFR, calculated using the CKD-EPI formula) of 149 PA patients before treatment and six months after adrenalectomy or start of spironolactone. Using multiple regression analysis, we assessed determinants for renal function after treatment (defined as eGFR at six months after treatment). We assumed hyperfiltration to equal eGFR decline after treatment (=eGFR before treatment – eGFR at six months after start of treatment).

Results: Renal function declined after treatment by 13,63 ml/min (range, -19–63; median, 11,50). Intrinsic or obstructive renal disease as a cause of decline was ruled out by urinalysis and renal ultrasound. Independent predictors of eGFR decline after treatment (=hyperfiltration) were pretreatment plasma aldosterone level (P<.001), estimated duration of hypertension (P=.009), baseline eGFR (P=.001), pretreatment plasma renin level (P=.012) and pretreatment plasma potassium (P=.005). Independent determinants of absolute eGFR after treatment were degree of hyperfiltration (P<.001), age (P<.001) and mean arterial pressure (P=.009).

Conclusions: Hyperfiltration is inversely related to renal function after treatment of PA. Patients with the worst residual kidney function after treatment have the highest degree of hyperfiltration before treatment.This suggests that aldosterone increases the filtration fraction and glomerular capillary pressure even in the presence of structural kidney damage. From our data we cannot conclude whether this structural damage is due to hyperfiltration, or due to a direct effect of aldosterone.

PP.39.21 CLINICAL SIGNIFICANCE OF PATIENTS WITH HYPERKALEMIA AFTER ADRENALECTOMY IN PRIMARY ALDOSTERONISM

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Objective: In patients with primary aldosteronism (PA), surgical treatment usually makes serum potassium (K) elevate relatively to normal range as compared with untreated period. In minority cases, moreover, we experience hyperkalemia requires medical treatment occurs after adrenalectomy. Although postoperative hypoaldsoteronism is previously reported as a contributor of this phenomenon, the mechanism is still unclear. New information about initial clinical significance and contributors of postoperative hyperkalemia is required to be aware of this crucial complication.

Design and method: All 116 patients participated in this study were treated and diagnosed as aldosterone producing adenoma (APA) in Tohoku University Hospital. Hyperkalemia was defined as more than 5.1mM in serum K. Mineralocorticoide receptor antagonists (MRA) were administrated to all patients after diagnosis of lateralityand the doses were adjusted to normalize serum K before adrenalectomy. Sufficient hydration of ECF were performed during operative periods for avoiding acute kidney injury (AKI) and hyperkalemia after adrenalectomy. We analyzed to investigate the contributor for elevated serum K and hyperkalemia after adrenalectomy.

Results: No patients became AKI and required hemodialysis. Initial eGFR, urinary albumin (UACR), β2microglobulin and renal resistive index (RI) were significantly correlated with postoperative serum K (maximum value), respectively. The value of elevated serum K after adrenalectomy were significantly correlated with decreased eGFR and aldosterone. Hyperkalemia was occurred in twenty-eight patients. 18 of them showed temporally (5.4mM) (Day 28th, mean value) (T-group) and rest of them did persistently (5.9mM) (Day 495th) (P-group). Clinical significance of T-group showed lower level of initial eGFR (71 ml/min/1.73m²) and higher level of UACR (70mg/gCre) as compared with

normoK-group (n=88). Elevated serum K, which significantly correlated with decrement of eGFR, was immediately and spontaneously recovered as normal range. In the meanwhile, those of P-group showed initial complication of severe renal damage (47 in eGFR, 111 in UACR, 0.70 in RI), hyperaldosteronism with elevated renin activity, aged and long-duration of exposed hypertension. Among them, no one required fludrocortisone therapy for hyperkalemia after adrenalectomy, although 3 were medically treated (diuretics and polystyrene sulfonate).

Conclusions: APA patients initially complicated with renal damage should be treated carefully for hyperkalemia after surgery.

PP.39.22 LONG-TERM EFFECTS OF ADRENALECTOMY OR SPIRONOLACTONE ON BLOOD PRESSURE CONTROL AND REGRESSION OF LEFT VENTRICLE HYPERTROPHY IN PATIENTS WITH PRIMARY ALDOSTERONISM

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Objective: Primary aldosteronism (PA) represents the most common reason of secondary hypertesion. Beyond increased blood pressure, additional harmful effects of aldosterone excess on the heart including myocardial fibrosis, enlargement of left ventricle (LV) cavity and inappropriate LV hypertrophy were found. However, whether these myocardial changes could be reversed by specific therapy in long-term, remains uncertain. In this study, we evaluated the effect of adrenalectomy and spironolactone on blood pressure and myocardial remodeling in long-term follow-up.

Design and method: A total of 31 patients with PA were prospectively recruited in long-term follow-up study. Of them, 15 patients with confirmed aldosterone producing adenoma underwent adrenalectomy, in remaining 16 patients, conservative treatment with spironolactone was initiated. Laboratory data, 24h ABPM and echocardiography parameters were evaluated at the baseline and at a median follow-up of 64 months.

Results: Both surgical and conservative approach reduced blood pressure to similar levels (to 127±12/78±8 mmHg in adrenalectomized and 128±11/81±7 mmHg on spironolactone, p=0.001 vs. baseline). In both groups we observed significant decrease in both end-diastolic (p=0.04, p=0.01) and end-systolic LV cavity diameters (p=0.03, p=0.01). Interventricular septum thickness reduction was apparent only in patients after adrenalectomy (p=0.01) as well as a drop in posterior wall thickness (p=0.03). Reduction in LV mass index was significant only after adrenalectomy (p=0.004). A trend to lower LV mass after spironolactone treatment was caused predominantly by diminution of LV cavity, which reflected also in the increase of relative wall thickness (p=0.05)

Conclusions: Although both surgical and conservative treatment can induce long-term decrease of blood pressure in patients with PA, adrenalectomy seems to be more effective in reduction of LV mass, as it reverses both wall thickening and enlargement of LV cavity diameters. Spironolactone treatment lead only to reduction of the size of LV cavity with no observed effect on wall thickness. This insufficient effect shows the possible harmful influence of persistent hyperaldosteronaemia, however the mechanisms remain unclear and desrve further investigation.

PP.39.23 RELIABILITY OF A BAYESIAN NETWORK TO PREDICT PRIMARY ALDOSTERONISM

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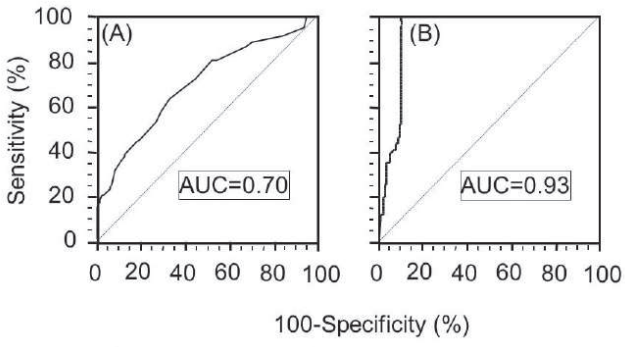
Objective: To improve selection of patient at risk of primary aldosteronism (PA) that remains difficult because it takes into account numerous variables with complex interactions.

Design and method: From five French "European excellence hypertension centers" institutional registers, data of consecutive patients referred between the first june 2008 and the 30 may 2009 were retrospectively collected. Patients were included if they had at least one of the following criteria: onset of hypertension before 40 years (55%), resistant hypertension (44%), history of hypokaliemia (38%), treatment by spironolactone (15%), and potassium supplementation (11%). Diagnosis of biological PA was based on an aldosterone-to-renin ratio>32 (ng/l)/(ng/l) in patients treated without agents altering the renin-angiotensin system. Bayesian network and stepwise logistic regression were used to predict a PA.



Receiver-operating-characteristic curve for PA probability using logistic regression (A) or a Bayesian network (B)

Results: 334 patients adult were included in the study. 89 cases were excluded for incomplete data (n=31), treatment with agents altering the renin-angiotensin system (n=32) or other secondary causes of resistant hypertension (n=26). Among the 245 case reports analyzed, 110 subjects had a biological PA and 135 subjects were considered as having an essential hypertension. Sensitivity reached (100% vs 63.3%) and specificity reached (89.6% vs 67.2%) using the Bayesian network or the logistic regression respectively. The area under the ROC curve (figure) obtained with the Bayesian network was significantly higher than the one obtained by the stepwise regression ($p<0.001$).

Conclusions: In hypertension centers, Bayesian network provided a satisfactory clinical prediction rule to detect patients with a PA. An external validation study is required before its use in primary clinical settings.

PP.39.24 PRIMARY HYPERPARATHYROIDISM AND CARDIOVASCULAR DISEASE. A CASE REPORT

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Objective: A 37-year-old bike-trained man with history of hypertension and kidney stones, treated with amlodipine 10 mg, was found to have echocardiographic myocardial calcifications and diastolic filling impairment. We evaluated a possible common cause among hypertension, kidney stones and myocardial calcifications.

Design and method: Secondary causes and target organ damage of hypertension were investigated by laboratory and instrumental analyses.

Results: At the admission in the outpatient clinic, BP was 180/110 mm Hg. Laboratory routine and ECG were normal, but urinary-albumin excretion was increased (77 mg/24 h). Echocardiography revealed moderate concentric left ventricular hypertrophy (LVH) [(mass/height 2.7) = 56.77 g/m2.7; relative wall thickness = 0.46], prolonged left ventricular relaxation (E/A ratio = 0.9; age and heart-rate adjusted E/A ratio= 0.6; Deceleration Time= 169 msec) and widespread dense spots, consistent with myocardial calcifications. Carotid intima-media thickness was increased. Laboratory analyses detected an altered calcium/phosphorus metabolism and a concomitant secondary hyperaldosteronism (see table).

	Patient's values	Normality range
Serum calcium (mg/dL)	12.6	8.9-10.3
Serum phosphorus (mg/dL)	2.0	3.0-4.5
Serum creatinine (mg/dL)	0.9	0.5-1.2
Parathyroid hormone (pg/mL)	96	10-75
24-hour urinary calcium (mg)	750	50-400
24-hour urinary phosphorus (mg)	820	400-1000
Plasma aldosterone (pg/mL)	211	12-125
Plasma renin (pg/mL)	60	0.9-13

Parathyroid scintigraphy showed right-inferior parathyroid adenoma. The kidney ultrasound scan revealed bilateral nephrolithiasis and nephrocalcinosis. Kidney's intraparenchymal vascularization was globally reduced by color-Doppler.

Conclusions: Symptomatic primary hyperparathyroidism, as presented by our patient, is associated with increased prevalence of hypertension, LVH independently of blood pressure, diastolic filling impairment, valvular and myocardial calcification, alterations of renin-angiotensin-aldosterone (RAA) system. These abnormalities well explain why is primary hyperparathyroidism also associated to increase cardiovascular mortality.

In the context of primary hyperparathyroidism, the increased activity of the RAA system, found in our patient, might be also correlated with the impairment of renal circulation, as suggested by the reduction of the intraparenchymal vascularization; thus it is conceivable that elevated levels of circulating parathyroid hormone may play a role in the pathogenesis of nephroangiosclerosis.

PP.39.25 DETERMINATION OF PLASMA METHOXYTYRAMINE AS A METASTATIC PHEOCHROMOCYTOMA BIOMARKER

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Objective: Determination of metanephrines (catecholamine metabolites) from blood plasma plays an important role in the diagnosis of pheochromocytoma (PHEO) and paraganglioma (PGL) – chromaffin cell tumors. We studied whether it is possible to utilize plasma 3-methoxytyramine, the O-methylated metabolite of dopamine, as a biomarker for malignant PHEO and/or PGL. In agreement with recent scientific articles, increased methoxytyramine can be used for distinguishing between patients with and without metastases.

Design and method: We tested patients with and without diagnosis of PHEO and/or PGL. The diagnosis of several selected patients was PGL of the head and neck accompanied by metastases.
All selected patients were fasting overnight and on a special diet before blood taking. Heparin was used as an anticoagulant. The blood corpuscles were separated by centrifugation. 3-methoxytyramine from plasma matrix was extracted by SPE (solid phase extraction) and subsequently determined by HPLC with electrochemical detection (HPLC–ED).

Results: In all patients with PGL of the head and neck accompanied by metastases, we found that the concentrations of plasma 3-methoxytyramine was at least ten times higher than in patients without metastases.
We observed no significant differences in methoxytyramine concentrations in patients with PHEO and/or PGL without metastases as well as in patients without tumor.

Conclusions: According to our results, plasma 3-methoxytyramine can be used successfuly as a biomarker for distinquishing between patients with metastatic malignant PGL and/or PHEO and patients with malignant PGL and/or PHEO without metastases. Furthermore, the methoxytyramine levels in patients with metastatic tumor and in patients without tumor did not distinct significantly.

PP.39.26 IMAGE TECHNIQUES IN THE DIAGNOSIS OF PRIMARY ALDOSTERONISM: WHICH IS THE OPTIMAL ONE?

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Objective: Primary aldosteronism (PA) is the most frequent endocrine cause of secondary hypertension. The classical clinical setting was hypertension accompanied by hypokaliemia and metabolic alcalosis due to an adrenal adenoma. Nowadays, different settings and morphologies are quite frequent in clinical practice.
Our aim is to study the sensibility and specificity of the image techniques (Computering tomography –CT- vs gammagraphy with i-cholesterol), for PA diagnosis.

Design and method: This is a retrospective study including 157 PA patients followed-up at the hypertension unit of the Hospital Clínico San Carlos, Madrid, Spain.

Results: 157 patients were included, 56.1% males. Mean age 56.9 (11.7) years-old. The most frequent organ damage was left ventricle hypertrophy, appearing in 69% of the cases.
CT diagnoses were: adenoma 28.3% (left 17.6%, right 10.7%), nodular bilateral hyperplasia 21.4%. Gammagraphy diagnoses: bilateral hyperplasia 51.9%, adenoma 19.5% (left 7.8%, right 11.7%). After completion of the study with adrenal vein sampling (AVS), final diagnoses were: nodular bilateral hyperplasia 34.2%, bilateral hyperplasia 31.6% and adenoma 17.4%.
We did not find concordance between techniques, with a kappa index of 0.00.
Concordance in the diagnoses of CT and AVS showed a sensibility of 91.3% and a specificity of 63.4% for adenoma diagnosis, and gammagraphy a sensibility of 91.2% for hyperplasia.

Conclusions: Bilateral disease is the most frequent diagnosis in our population, independently of what technique was used.
In patients with PA, a complete study should be performed, and AVS is mandatory before an aggressive treatment was performed, as its results might change in a relevant way the previous diagnosis. Up to 10% of adenomas suspected in CT do not have an unilateral secretion of aldosterone in AVS.
Concordance between CT and gammagraphy is very low; therefore, clinicians should keep in mind their different sensibility for every diagnosis in PA population.

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PP.40.01 THE DEPENDENCE OF BLOOD PRESSURE OF ANTHROPOMETRIC DATA OF A PERSON UNDER THE AGE FROM 16 TILL 30 YEARS

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Objective: Blood pressure is one of the important parameters of human organism, which is associated with a large number of physiological and biochemical processes that can influence on the anthropometric parameters of the organism. Some of the anthropometric characteristics of the human body can be influenced by changing lifestyle, diet etc. Therefore, it is important to know how an anthropometric parameter can affect blood pressure. Thus the main task of this research is to study the relation of blood pressure with the anthropometric parameters of human organism.

Design and method: The study involved 120 people (80 men and 40 women) aged from 16 to 40 years. Blood pressure measurement was taken within 5 minutes after sitting position. Anthropometric data included the following parameters: 1. Sex, 2. Age (full years), 3. Height (cm). 4. Weight (kg). 5. Hip size and waist (cm). 6. Body composition was checked by bioimpedansmetr analyzer from company «Medass».

Results: The correlation between the measured and calculated systolic blood pressure in men. R=96% p<0.0001).
A multiple regression equation in this case is presented below:
AD Syst. = 98.0 - the 76,429*Inside fluid - 1,53048*Main fluid exchange - 13,0219*body mass Index + 69,4529*Skinny weight + 29,9356*Active cell mass + 5,42969*the Share of the active cell mass - 12,0383*Skeletal muscle mass + 0,792946*the main fluid exchange - 55,0804*Extracellular Fluid + 5,79741*%fat mass.
The correlation between the measured and calculated systolic blood pressure in women. R=99% p<0.0001). A multiple regression equation looks like this:
ADsis. = 98.0-the 2,0545*age - 7,47313*weight + 1,73552*waist size -95,4431*Phase angle + 125,776*Inside fluid + 11,0272*body mass Index 141,321*Skinny weight + 24,7281*the Share of the active cell mass + 20,6819*Skeletal muscle mass - 8,02601*Share of skeletal muscle - 0,638736*specific BX + 76,1769*total liquid + 96,296*Extracellular fluid.

Conclusions: This study showed that the blood pressure in young men and women can be predicted by anthropometric data. It can be used to assess the effectiveness of the treatment of hypertension by different groups of drugs in clinical trials.

PP.40.02 FACTORS, ASSOCIATED WITH LONG-TERM ADHERENCE TO ANTIHYPERTENSIVE MEDICATIONS IN PATIENTS OF CARDIOLOGY CLINIC IN RUSSIA

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Objective: To analyze the factors associated with adherence to antihypertensive therapy (AHT), prescribed to the patients with hypertension (AH) in the specialized outpatient cardiology clinic.

Design and method: A Study includes two stages. On the the first stage we analyzed medical records of all patients with AH (1766 persons), first applied to specialized cardiac clinic in Moscow to the clinic in 2010 year. The second stage included telephone survey of 1419 patients which we were able to reach at 6 months after the first visit to the clinic (response rate 80.4%). The special questionnaires were developed to evaluate patients adherence and factors, associated with it.

Results: During the telephone survey 74.9% of patients reported every day taking the prescribed medications, 8.9% did not take the medications at all, and 16.2% of respondents take AHT periodically. At the same time, 74.9% of respondents changed the recommended scheme of treatment.
Factors associated with the refuse of treatment included male gender (10.1% vs women 5.8%, p=0.001), younger age (aged 30-50 years 13.5% vs older 60 years 5.3%, p<0.05), absence of comorbidity (absence of CHD 10.6% vs CHD comorbidity 4.1%, p<0.0002), AH diagnosis less than 5 years (11.8% vs more than 5 years 4.1%, p<0.0002).
Factors associated with a AHT schema change included: CHD comorbidity (64.3% vs 55.8% absence of comorbidity, p=0.0003), AH diagnosis more than 5 years (69.5% vs less than 5 years 60.4%, p=0.0003), absence of calcium channel blockers (74.4% vs 68.5%, p=0.03), and fixed combinations (76.1% vs 60.3%, p<0.0002), but the use of beta-blockers (74.8% vs 69.2%, p=0.03) in the treatment.
Causes of treatment regimen changing included: absence of medication's reimbursement (23.4%), the recommendation of another physician (21.9%), poor tolerance of therapy (19.9%), return to previous therapy (19.3%), the high costs of treatment (18.4%).

Conclusions: Results of the study revealed a category of patients who need special attention due to the risk of failure of AHT or change the recommended treatment regimens.

PP.40.03 COMPLIANCE OF ANTIHYPERTENSIVE TREATMENT IN LVIV CLINICAL HOSPITAL N4 IN UKRAINE ACCORDING TO GUIDELINES OF EUROPEAN SOCIETY OF HYPERTENSION

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Objective: Hypertension is the most important modifiable risk factor for coronary heart disease, stroke, congestive heart failure, end-stage renal disease, and peripheral vascular disease, but the irrational choice of antihypertensive therapy and polypharmacy may lead to undesirable consequences.

Design and method: The study included 50 patients of both sex (25 male and 25 female) aged 40-60 years with hypertension II stage without other cardiovascular or systemic diseases. We used retrospective analisis of medical histories of patients, who were treated during 2010-2011 in Lviv Clinical Hospital N4, in Ukraine.

Results: In the course of analysis of prescribed therapy in Lviv Clinical Hospital N4 following results were obtained: 22% of patients with hypertension the 2nd stage received monotherapy, 76% of patients received combination of 2-3 first-line antihypertensive drugs, 1 patient (2%) did not receive any antihypertensive drug. Aspirin was prescribed to 52% of patients, statins were prescribed to 82% of patients. All 50 patients (100%) received «metabolic therapy», which doesn't have proven effectiveness and is not recommended by guidelines of European Society of Hypertension.

Conclusions: Retrospective analysis of medical histories of patients with hypertension the 2nd stage in Lviv Clinical Hospital N4 demonstrated satisfactory compliance to guidelines of European Society of Hypertension, although subscription of metabolic therapy for patients with hypertension is too high, despite the lack of evidence based recommendations.

PP.40.04 COMPARING BLOOD PRESSURE CONTROL IN HYPERTENSIVE PATIENTS WITH DIFFERENT FOLLOW-UP VISIT RATE. A RETROSPECTIVE STUDY

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Objective: The aim of the present study was to compare blood pressure control in hypertensive patients that had follow-up visit intervals either less than a year or between one to three years.

Design and method: This retrospective population study consisted of 718 hy-

pertensive non-diabetic adult patients (218 males) aged 26-80 years old (mean 57.7±9.8 years) of an outpatient hypertension clinic of a tertiary hospital that were followed up for three to twenty years (mean 7.8±4.1 years). A descriptive analysis was performed to assess the population systolic, diastolic and mean arterial blood pressure (SBP, DBP and MAP) at baseline and last visit. Patients were grouped in two groups according to the mean interval between their visits. The means of these groups were compared using an independent samples t-test.

Results: The mean SBP, DBP and MAP at baseline were 149.7±14.8, 90.2±8.7 and 110±8.7mmHg respectively and were similar in the two groups. The mean SBP, DBP and MAP at last visit were 143.8±15, 84.6±7.3 and 104.3±8.4mmHg respectively. Independent samples t-test revealed a significant mean MAP difference (-2.55±0.23mmHg, p<0.001) between patients who had mean visit intervals less than a year (mean MAP=104.6±8.9mmHg) and patients with mean visit intervals between one to three years (mean MAP=107.2±8.9mmHg).

Conclusions: Patients with closer follow-up appeared to have a better blood pressure control. This could be the result of both better compliance and early intervention.

PP.40.05 DURATION OF FOLLOW-UP AND CONTROL OF CARDIOVASCULAR RISK FACTORS IN ELDERLY OUTPATIENTS

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Objective: Weakening of compliance is one of the main reasons of failure in the treatment of cardiovascular risk factors (CVRFs) and often leads to weight gain in obese patients after the first months of diet. Compliance can be improved by enhancing patient's motivation through an empathetic reinforcement. This longitudinal intervention study aimed at assessing the impact of empathetic reinforcement on the treatment of CVRFs in an elderly outpatient population. We hypothesized that in well-motivated patients the effects of treatment on CVRFs should not fade during the follow-up.

Design and method: 406 patients (306 F) over 60 years of age, referred to 2 public Outpatient Clinics for CVRFs control, were visited by the same physician for a period up to 183 months (M±SD =23±35, median =6.1). The recommendations of US guidelines on hypertension treatment about empathetic reinforcement were applied. Lifestyle was assessed by a structured questionnaire. Decimal logarithm of follow-up duration and of number of visits were used, in order to normalize their distribution.

Results: Body mass index (BMI) (33.7±6.4 to 32.6±6.1 kg/m², p<0.001), blood pressure (BP) (154/86±25/12 to 142/79±23/11 mmHg, p<0.001), waist circumference (WC), cholesterol, and triglyceride levels were significantly reduced during the follow-up. Smoking habit (SH) was also reduced (sign test significance =0.005).
Change in BW and in diastolic BP were significantly correlated with follow-up duration (r= -0.186, p<0.001 and r= -0.137, p<0.01 respectively). Number of visits was correlated with changes of the following variables: BW (r= 0.252, p<0.001); diastolic BP (r= -0.119, p<0.02); cholesterol (r= -0.133, p<0.05); triglyceride (r= -0.202, p<0.005).
Stepwise multiple regression analysis showed that percent BW change was independently associated with baseline BW and with follow-up duration (R^2=0.094; significance <0.001), but not with age, gender, education level, physical activity and SH. Percent diastolic BP change was independently associated with baseline BP, follow-up duration and either physical activity (R^2=0.242) or SH (R^2=0.243; significance <0.001 for both analyses).

Conclusions: These data suggest that empathetic reinforcement is useful in the treatment of CVRFs in elderly outpatients. In particular, BW gain, which usually follows the initial effect of hypocaloric diet in obese patients, is avoided.

PP.40.06 PREVALENCE OF CONTROLLED HYPERTENSION AT THE 'UNIDAD DE HIPERTENSION ARTERIAL HOSPITAL JOSE MA VARGAS TACHIRA' DURING 2009-2013

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Objective: Hypertension is a major risk factor for heart disease and stroke. And is the first atributable cardiovascular risk of mortality around the world Hypertension treatment reduce cardiovascular mortality and morbility,but instead of this, the grade of controlled hypertension at tragets values are so poor. it is around 20% like the Carmela study,a seven latin american countries. The objetive is evaluated the prevalence of controlled hypertension at our unit.

Design and method: An observational,crossectional study, a 2850 patients atended during 2009 to 2013 period, 734 medical records were evaluated, blood pressure was taken by Oscilometric thecnic, using OMRON 907 device, peronal,family hystory were taken,anthropometric data was registred, therapheutic aproach was doing using the binding titration in two steps,the low risk patients satrted with one drug,high and very high risk patients started with combination, uptitration was doing to forced BP control, and up to doble doses each month.laboratory test were performed, ECG, and ABPM

Results: of 2850 records only 734 meet the inclusión and exclusión criteria,439 (59,81%) patients were controlled reach BP below 140/90 , 295 (40,19%) were uncontrolled,69.37% were women, 17% of controlled hypertension were under monotherapy 83% were on combination therapy, patients uncontrolled are in a high and very high cardiovascular risk, had insulin resistence HOMA ir Averega in 3.4, and had a non dipping pattern.

Anthropometric data, baseline and last blood pressure

	First visit		Second visit		Third visit		Uncontrolled hypertension	
	Media	Standar Desviation	Media	Standar Desviation	Media	Standar desviation	Media	Standar Desviation
Age	52,85	11,67	53,71	9,67	61,75	9,95	56,05	13,48
Weight	73,18	15,29	69,52	15,66	71,84	18,22	76,95	17,43
Height	1,59	0,08	1,65	0,11	1,57	0,11	1,60	0,09
Waist Circunference	96,22	14,82	94,33	6,58	94,21	11,43	100,17	12,30
Body mass Index	28,52	5,16	25,78	3,29	29,10	7,45	29,82	5,41
Heart reat	71,14	13,06	75,57	8,46	70,00	14,09	72,31	12,24

Conclusions: the prevalence of controled hypertension were 59,81, patients individualitation were the best strategy to aproach hypertension in a mono or combination therapy, and to chose the better class of drug.

PP.40.07 ADHERENCE FOR THE CHRONIC MEDICATION THERAPY

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Objective: Adherence is a complex behavioral process strongly influenced by the environments in which people live, health care provider practice, and health care systems deliver care. Medication adherence usually refers to whether patients take their medications as prescribed and whether they continue to take a prescribed medication. The impact of poor adherence grows as the burden of chronic disease grows worldwide.
Adherence to long-term therapy for chronic illnesses in developed countries averages 50%.

Design and method: The cross-sectional survey was conducted at 106 Zagreb, Croatia pharmacies and the questionnaire was filled out by the study subjects. We used a 33-item self-administered questionnaire that included a convenience sample of 635 individuals who were buying drugs for the treatment of chronic diseases. Study subjects were divided into two groups, with adherent defined as a "yes" response to the statement that they "never fail to take their medication on time".

Results: In our study population (n=635), non-adherent subjects prevailed over adherent subjects (n=370; 58.3% vs. n=265; 41.7%). The most common diagnoses were diseases of the circulatory system (n=500; 36.8%) and endocrine, nutritional and metabolic diseases (n=285; 21.0%). The great majority of study subjects reported forgetfulness ("I just forgot") as the main reason for skipping drug doses, followed by being away from home and shortage of the drug (having consumed it all). Comparison of reasons for medication noncompliance in total study population versus subjects on antihypertensive therapy showed no statistically significant difference in any of the reasons (P=0.895).

Conclusions: Nonadherence to medication is a growing concern to patients, physicians, healthcare systems, and other stakeholders because that it is prevalent and associated with adverse outcomes and higher costs of care. There is usually no single reason for medication nonadherence, and therefore must be

a comprehensive approach to improve adherence. Research on adherence has typically focused on the barriers patients face in taking their medications. Common barriers to adherence are under the patient's control, so that attention to them is a necessary and important step in improving adherence.

PP.40.08 INFLUENCE OF PATIENT WAYS OF COPING WITH HYPERTENSION ON THE COMPLIANCE OF THE ANTIHYPERTENSIVE THERAPY WITH A FIXED DOSE COMBINATION THERAPY: BETWEEN REASON AND EMOTION

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Objective: To analyze the ways of coping of hypertensive patients and its influence on the antihypertensive therapy

Design and method: French National Observational cross-sectional study conducted by 600 general practitioners who included 1976 patients aged 61,8±10.3 years (61% males), treated from at least 3 months by a fixed antihypertensive association (ACE inhibitors+CCB). Coping was evaluated using the Ways of Coping Checklist (WCC), a psychometric scale assessing the problem focusing coping (PFC: ability to deal with the disease), the emotion focusing coping (EFC: tactics developed by the patient to regulate the emotional impact of the disease) and the seeking for social support (SSS) through a self questionnaire. Compliance was evaluated using the Morisky score.

Results: According to the WCC, the PFC score was low (<36) in 83.1% of the patients whereas 73.5% of them showed an elevated EFC (>=26). Elevated SSS (>=21) was reported in 64.1% of the patients. Compliance was decreased in patients showing a low PFC in comparison to those with an elevated one, with a poor compliance (<6) in 57.3% vs. 43.6% of the patient respectively ($p<0.0001$). In contrast, an inverse relationship was shown with respect to EFC with a poor compliance reported in 57% of the patients displaying a high EFC vs. 49.2% of the patients with a low EFC ($p<0.01$). SSS does not appear to influence compliance with a low compliance reported in 53.8% of the patients with elevated SSS vs. 56.9% of those with low SSS (p=NS).

Conclusions: The ability to cope with hypertension appears quite weak in hypertensive patients whereas they demonstrate an elevated emotional coping. However, our results demonstrate that intense emotional coping and poorly developed strategies to cope with the disease both negatively influence the patient's compliance. Even though the majority of the patients are seeking actively for social supports, it does not play any role in the level of compliance. Taken together our data suggest that helping the patients to cope with hypertension and decreasing the emotional impact of its complications through the medical communication might have a positive impact on the patient's compliance of antihypertensive therapy.

PP.40.09 THE IMPACT OF HYPERTENSION COMPLICATIONS KNOWLEDGE ON ANTIHYPERTENSIVE ADHERENCE REGIMEN

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Objective: Non-adherence is thought to be one of the major common causes of uncontrolled hypertension over the world leading to useless drug dose or class changes which may lead to increased adverse effects and medical costs.
The aim of the current survey was to investigate whether hypertension complications knowledge improve antihypertensive treatment adherence.

Design and method: A cross-sectional study was carried out between May and November 2013 on a representative sample of 453 hypertensive patients at public primary care outpatients in the department of Tlemcen in Algeria. Patients with cardiovascular complications history were excluded.The adherence was assessed with the adherence evaluation scale of Girerd using a self-reporting questionnaire wich contains six items with closed dichotomous responses (yes/no), the degree of adherence was calculated according to the score resulting from the sum of all (yes) answers.A cut-off value of 80% was used to categorize patients as adherent or non-adherent. A structured questionnaire has been performed including patients knowledge about hypertension complications and the others factors which may affect adherence therapy. Statistical analyses was performed using SPSS 17.0

Results: Among the 453 patients included in the study, only 35,32% were adherents. In univariate analysis,knowledge about hypertension complications improved adherence. However, comorbidities, and number of antihypertensive drugs prescribed, was associated with poor adherence. In multivariate logistic regression, a significant difference was shown between adherents and non-adherents according the factors mentioned above and the insurance statute (table).

Independent variable	*univariate analysis*		*Multivariate analysis*	
	OR	P value	OR ajusted	P value
Complications knowledge	0,493(0,307-0,791)	0,003	0,462(0,283-0,755)	0,002
Comorbidity	1,79(1,186-2,702)	0,006	2,123(1,356-3,323)	0,001
Antihypertensive drugs number	1,392(1,075-1,803)	0,012	1,362(1,045-1,777)	0,023
Insurance statue	0,587(0,303-1,138)	0,111	0,447(0,222-0,906)	0,026

Conclusions: This study emphasize the beneficial impact of the hypertensive complications knowledge on adherence. Moreover, using fixed-dose combinations and once-daily therapy may improve effectively adherence to antihypertensive therapy.

PP.40.10 PREVALENCE OF TYPE OF NON-COMPLIANCE IN PATIENTS WITH HYPERTENSION

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Objective: To reveal a prevalence of non-compliance among patients with hypertension represented pedagogical staff of the Azerbaijan Pedagogical University.

Design and method: 115 patients (79 female,36 male; age 35 - 70) with hypertension (stage 1-3) were interviewed to reveal prevalence of non-compliance type.
Receiving a prescription but not filling it - 3 pts(3 male)
Taking an incorrect dose 43pts(29 male, 14 female)
Increasing or decreasing the frequency of doses- 9 (8 male,1female)
Stopping the treatment too soon - 68 (59male, 9 female)
Delaying in seeking health care - 23 (20male, 3 female)
Non-participation in clinic visits - 56 (47male, 9 female)
Failure to follow doctor's instructions - 12 (all male)
Patients stop the therapy for a while and then restarts the therapy - 96 (81male,15 female).
Patients are compliant to the medication regimen around the time of clinic appointments - 64 (47 male,17 female).

Results: Stopping the therapy for a while and then restart the treatment,stopping the treatment soon, patients are compliant to the medication regimen around the time of clinic appointments,non-participation in clinic visits - the major type of non-compliance in cohort of patients with hypertension.

Conclusions: Non-compliance to medications in patients with hypertension remains problem and this problem has to be resolve.

PP.40.11 PRICE OF THE DRUG AS A BARRIER TO EFFECTIVE TREATMENT OF ARTERIAL HYPERTENSION IN THE PERCEPTION OF PHYSICIANS AND PATIENTS

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Objective: Identify feelings for antihypertensive drugs costs of doctors and patients in Russia.

Design and method: The study involved 485 healthy respondents and 420 patients with arterial hypertension (AH) aged 25 to 85 years. Compared groups did not differ in age and sex. Parallel investigated 540 therapists and cardiologists outpatient practice. The study was conducted in Nizhny Novgorod, Perm, Cheboksary, Stavropol, Kazan, Kirov, Ryazan, Yekaterinburg and Vladivostok. Survey research methods were using the technique 'Incomplete proposals' (variant of a Sachs-Sydney) and profile in the form of an extended interview (multiple choice answers from questions).

Results: Difficulties for the physician in the treatment of hypertensive patients is 'the unwillingness of the patient to be treated' (65.3%) and 'high price of the drug' (64.7%). Doctors prescribe original and modern drugs, first consult

with the patient and find out whether this treatment is inexpensive cost (79.6%). 25.7% of doctors are experiencing inner feelings in this case. Doctors characterize modern antihypertensive drugs as 'effective' (61%), 'not effective, poor' (17.9%), 'above all, expensive' (21.1%). Patient is ready to take any medicine if the doctor will explain what the medication (45% of patients with hypertension and 42% of respondents). 30% of patients don't fulfill the doctor's recommendation, as it does not believe the doctor. 38% of patients are afraid of side effects, and 21% did not understand the explanation physician. Only 28% of women and 19% of men with AH called modern drugs expensive and cannot accept them. 50% of men and 43% of women with hypertension noted that price is important, but if the doctor will explain what they are willing to buy an expensive and effective drug. 43% of women and 29% of men with hypertension responded that more important for them to be treated effectively.

Conclusions: For a doctor in Russia, the price of the drug is a powerful barrier in the treatment of hypertensive patients. He believes that modern antihypertensive drugs are expensive and inaccessible to the public. Treatment is the main for the patient, so the price of the drug is not a barrier.

PP.40.12 FACTORS ASSOCIATED WITH 2-YEAR PERSISTENCE IN FULLY NON REIMBURSED LIPID-LOWERING TREATMENTS (STATINS AND NUTRACEUTICALS)

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Objective: Long-term persistence on lipid-lowering treatment is usually low in clinical practice. The lack of treatment reimbursement is one of the main predictors of non-persistence in therapy. Our aim was to evaluate the main factors associated with long-term persistence in lipid-lowering treatment among patients without right to drug reimbursement.

Design and method: We retrospectively evaluated the clinical charts of moderately hypercholesterolemic subjects visited each 6 months over at least 2 years during a 6-year period in the outpatient lipid clinics of the University of Bologna, in primary prevention for cardiovascular disease, without right to reimbursement of lipid-lowering treatments based on the Italian regulation. We selected 628 subjects (M: 307; F: 311, mean age 59±9 years old), to whom we firstly prescribed a statin (N. 397) or different kind of lipid-lowering nutraceuticals (N. 231), mainly containing red yeast rice more or less associated to other active components. Then, depending of their will, patients took brand statin (N. 194) or generic statins (N. 203), without significant differences among genders.

Results: In our cohort of patients, the main determinants of long-term persistence in therapy are female sex, family history of early cardiovascular disease, baseline LDL-C and treatment with nutraceuticals versus statins. Persistence appears not to be influenced by patient age, smoking habit, adverse events during treatment, and estimated cardiovascular risk. The target LDL-C<115 mg/dL was reached by the 76% of patients on statins (without significant differences between generic and brand statins) and by the 67% of those on nutraceuticals ($p<0.05$).

Conclusions: On the basis of our data, it seems that the use of lipid-lowering nutraceuticals is associated to a higher long-term persistence in therapy than full paid statins, while the use of brand statins a higher persistence in therapy than generic drugs, independently from the cost of the treatment.

PP.40.13 THE DEVELOPMENT AND VALIDATION OF A SCALE ASSESSING FACTORS INHIBITING THE LEVEL OF ADHERENCE AMONG PATIENTS WITH HIGH BLOOD PRESSURE

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Objective: The purpose of the present study was to develop and validate a scale in order to examine the contribution of five significant factors in level of adherence among hypertensives.

Design and method: From a pool of questions derived from a review of relevant literature, 24 items were initially selected for the first draft of the scale. A panel of seven experts who specialized in blood pressure clinical research and practice assessed the content validity of the initial scale. Participants indicate their degree of agreement with each statement on a five-point Likert scale (where 0 = strongly disagree, 1 = disagree, 2 =uncertain, 3 = strongly agree and 4 =strongly agree).This study used a case-report survey design. Data collection for this research occurred between February 7, 2013 and March 10, 2013. The sample consisted of 68 participants both hypertensives and non-hypertensives and were standardized regarding to sex, age, marital status and educational status.

Results: The Cronbach' alpha factor for total scale among hypertensives and non-clinical sample was 0.853 and 0.781, for economic factors was 0.782 and 0.764, for patient-family relationship was 0.827 and 0.807, for level of accessibility was 0.722 and 0.697 and for patients' life style was 0.691 and 0.591, respectively, whereas for patient-physician relationship was 0.699 in both samples. The regression analysis proved that patient-physician relationship, level of accessibility and economic factors were strongly associated with persons' keeping appointment in both samples; however the greatest contribution had the relationship with physicians ($p<0.01$). On the contrary, poor medication adherence was associated with economic factors, however, the greatest contribution had patients' life style (beta=0.769 and 0.782, respectively, $p<0.01$). Finally, adherence in life style recommendations was influenced only by the patient-physician relationship in both samples (beta=0.998; $p<0.01$).

Conclusions: The tool is appropriate to assess factors affecting adherence in self-behaviours both in hypertensives and non-clinical samples. It is essential that economic factors influence more patients' adherence in appointment keeping than in medication adherence. In addition, the patient-physician relationship underlies the main factor for patients to follow a healthy life style and to enhance their self-behaviours.

PP.40.14 INTERRUPTION OF TREATMENT AND BLOOD PRESSURE CONTROL: CHALLENGES AND PROSPECTS MULTIDISCIPLINARY TEAM

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Objective: To evaluate compliance to treatment of hypertensive patients with uncontrolled pressure in specialized service, knowing the dropout rate to the service and blood pressure control.

Design and method: This is case-control study with hypertensive patients in specialized treatment. We identified all those who were there more than a year without attending to any query and these were considered in situations of abandonment of service. It was also calculated the rate of blood pressure control. The outcome variable was the uncontrolled BP and predictor variables were: sociodemographic variables, number of antihypertensive use, lifestyle, risk factors for cardiovascular disease, body mass index, time since diagnosis, treatment time and treatment time in the specialized service and adherence to pharmacological treatment. To assess compliance, we applied the Morisky-Green test both among those identified as hypertensive uncontrolled blood pressure (case group) and among those with controlled pressure (control group).

Results: In 2011, the dropout rate in service was 6.4%, and in 2012 this rate was 11.0%. The rate of blood pressure control in 2011 was 73.9% and in 2012 was 61.7%. Those who had uncontrolled pressure had more patients in situations of low adherence (64.5%) than the group of controlled hypertensive (43.3%).

Table 01 – Distribution of the number and percentage of patients according to the evaluation of adherence by Morisky-Green test of each group. Goiania, Goias, 2013 (n=140).

		Case Group (n=110)		Control Group (n=30)		p
		n	%	n	%	
High Adherence		39	35,5	17	56,7	**0,04**
Low Adherence		71	64,5	13	43,3	
• Non-intentional Adherence	Low	51	46,4	11	36,7	0,34
• Intentional Adherence	Low	-	-	2	6,7	**0,01**
• Low Adherence behaviors	both	20	18,2	-	-	**0,01**

Conclusions: We found a low dropout service compared to other centers. This is reflected in the rate of BP control. Non-adherence to treatment may explain the lack of BP control.

PP.40.15 THE NURSING INTERVENTION AND ITS REFLEXES ON THE PERCEPTION OF THE ILLNESS AND THE ADHERENCE TO THE TREATMENT BY HYPERTENSIVE PATIENTS: A RANDOMIZED CLINICAL TRIAL

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Objective: To evaluate the nursing intervention reflexes on the compliance to the treatment by hypertensive patients with uncontrolled blood pressure.

Design and method: The study group (SG) received interventions through weekly phone calls and nursing consultations after the medical consultation. The control group (CG) remained in their routine treatment. In the first and in the last approach, tests were administered in order to evaluate the adherence to the pharmacological treatment, perception and patient´s beliefs. It is a randomized controlled trial.

Results: The reduction of the average systolic blood pressure on the SG (28.4 mmHg) was higher than on the CG (20.7 mmHg) ($p<0.05$). In the end, there were no alcoholic patients on the SG. The difference in the reduction of the adherence rates was of 46.6% on the SG, and 27.6% on the CG ($p<0.05$). Those who had a better perception of the personal control over the illness had higher adherence to the pharmacological treatment.

Conclusions: The intervention done by the nursing altered both treatment adherence and blood pressure control rates. The group that participated of the intervention showed better understanding over the chronicity and consequences of the illness.

PP.40.16 EVALUATION OF GUIDELINES ADHERENCE FOR ASPIRIN DOSING IN PATIENTS WITH CORONARY HEART DISEASE

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Objective: To study the prescribing patterns and evaluate guidelines adherence for aspirin dosing in patients with coronary heart disease (CHD).

Design and method: In this descriptive cross-sectional study, 66 CHD patients admitted to McCormick hospital between January 2008 and May 2012 were enrolled by simple random sampling. The guidelines adherence for aspirin dosing was assessed by using the medical assessment tool developed from ACC/AHA guidelines. Data were analyzed by descriptive statistics.

Results: Most of patients were female (54.5%) and mean age was 63.8±13.8 years. Hypertension, diabetes mellitus, and dyslipidemia accounted for 51.5%, 30.3%, and 22.7 of patients, respectively. Overall, the average of guidelines adherence score for aspirin dosing was 20.3% and was better for patients with unstable angina (44.4%) than patients with NSTEMI (27.3%), patients who were not classified type of CHD (9.5%) and patients with STEMI (0.0%). Totally, the majority of patients (75.7%) had guidelines adherence score less than 20.0%, but only few patients (4.5%) got 80.0% or more.

Conclusions: This study has demonstrated that guidelines adherence for aspirin dosing in patients with CHD was extremely sub-optimal, especially in NSTEMI and STEMI. There is still much room for improving aspirin dosing in clinical practice for these patients.

PP.40.17 EVALUATION OF GUIDELINES ADHERENCE FOR ANTIHYPERTENSIVE DRUGS PRESCRIBING IN HYPERTENSIVE PATIENTS WITH CHRONIC KIDNEY DISEASE

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Objective: To study the prescribing patterns and evaluate guidelines adherence for antihypertensive drugs, and to quantify the achievement of target blood pressure control in hypertensive patients with chronic kidney disease.

Design and method: In this cross-sectional descriptive study, 99 patients with hypertension and chronic kidney disease who received medical treatment from outpatient department of McCormick hospital between December 2010 and August 2013 were enrolled by simple random sampling. Patients who were provided health services or antihypertensive medications from any other health care facility were excluded. The guidelines adherence for antihypertensive drugs prescribing was assessed by using the medical assessment tool developed from JNC 7 and NKF-K/DOQI guidelines. Data were analyzed by descriptive statistics.

Results: The mean age of patients was 57.0±13.8 years and most of them (61.6%) were male. Diabetes mellitus, dyslipidemia, and gout accounted for 54.4%, 25.6%, and 25.6% of patients, respectively. The average number of antihypertensive drugs prescribed was 2.0 ± 1.2. The most frequently prescribed antihypertensive drug was CCBs (71.1%), but only 31.3% for ACEIs/ARBs. Overall, the average of guidelines adherence score was 67.1% and was better for treatment criteria domain (89.1%) than antihypertensive drugs use domain (72.3%) and treatment follow-up domain (55.5%). Blood pressure control was the worst domain because only 29.3% of patients had achieved the target blood pressure goal. Totally, almost half of patients (46.4%) had guide adherence score between 60.0%-79.9% but only one-fifth of patients (23.2%) got 80.0% or more.

Conclusions: The present study has demonstrated that antihypertensive drugs was quite optimally prescribed follow the standard treatment guidelines in hypertensive patients with chronic kidney disease, but there is still much room for improving clinical practice for these patients especially achievement of blood pressure control. This information will be useful for guiding and raising the awareness of physicians in practice for the prescribing of antihypertensive drugs in chronic kidney disease patients and also leading to achievement of blood pressure control, decrease complications and death of patients.

PP.40.18 CORRELATION OF SEX, ANTHROPOMETRIC MEASUREMENTS AND COMPLIANCE TO ANTIHYPERTENSIVE TREATMENT WITH BP CONTROL IN HYPERTENSIVE PATIENTS

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Objective: The effect of sex, body mass index (BMI) and monotherapy or fixed combination on the effective treatment of hypertension has been the subject of research. The object of this study was to investigate the correlation between BMI and antihypertensive therapy with blood pressure (BP) control in two sexes.

Design and method: Retrospective study of 540 hypertensive patients (229 men and 311 women, mean age 73 +2, 50 to 85 years old) from the Outpatient Hypertension Clinic of a tertiary University Hospital (2011-2012). Their weight, height, antihypertensive medication and compliance as well as measurements of BP were recorded.
The data were analyzed using the SPSS version 15.0 for Windows. For the comparison of categorical variables, chi-square test was used. The level of statistical significance was defined as P value <0.05

Results: 207 patients (38,2%, 14.04% men and 24.26 % women, $p<0.05$) have well controlled (WC) BP. A comparison of anthropometric parameters between men and women with well controlled BP, showed that BMI was an independent factor for the control of BP ($p<0.05$).

	Monotherapy (M)	Fixed Combination of two medications (FC)	Women	Men	BMI
Well controlled (WC) (n=207)	68.12%	31.88%	63.28% (40.58% M 22.7% FC)	36.72% (27.54%M 9.18%FC)	27.4 (Men:26 Women: 28)
Not controlled (NC) (n=333)	65.77%	34.23%	54.05% (36.03%M 18.02%FC)	45.95% (29.73% M 16.22%FC)	29 (Men:27.4 Women: 30.4)

Table 1 shows the percentages of the patients-according to sex- receiving monotherapy or fixed combination in the study population

From table 1, it can be deduced that most of the patients were receiving monotherapy and even when receiving combination of antihypertensive medications, they were receiving only two. In the group of WC patients, there were more women WC than men ($p<0.05$). More women WC were receiving >1 medication in FC compared to men ($p<0.05$).

Conclusions: BMI is confirmed as an important parameter for the BP control. Women are a majority in the WC group and despite the fact that they have higher BMI, 2/3 of them receive monotherapy and furthermore there is a statistically significant difference in FC treatment compared to men. The better control of BP in women can be explained by the greater proportion of combination therapy and so the better compliance to treatment.

PP.40.19 ANTIHYPERTENSIVE MEDICATIONS ADHERENCE AND ITS DETERMINANTS IN NIGERIAN HYPERTENSIVE SUBJECTS

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Objective: Achieving good blood pressure control in hypertensive subjects is key to reducing the risk of cardiovascular events and mortality. Poor adherence to medications has been linked with increased cardiovascular risk and mortality in many populations. Africans have been shown to have a worse prognosis from hypertension and kidney diseases when compared to Caucasians.
Objectives: To describe the frequency of adherence to antihypertensive medications, relationship to blood pressure control and its determinants among hypertensive subjects attending LAUTECH Teaching Hospital, Ogbomoso, Nigeria.

Design and method: An analytical cross sectional study. The 8 parameter Morisky scale was used to assess for adherence to antihypertensive medications. Clinical and demographic data were taken. Statistical analysis was done using SPSS 17.0. P<0.05 was taken as statistically significant.

Results: One hundred and fourteen hypertensive subjects were recruited for this study. They consisted of 60 males (52.6%) and 54 females (47.4%). The mean age was 63.63±14.10 years. High adherence, low adherence and medium adherence as defined by Morisky scale was found in 42(36.8%), 27(23.9%) and 45(39.5%) respectively. High adherence seems to be associated with fewer medications but not with the duration of hypertension. Those with good adherence were likely to be older, had a higher level of education, higher average monthly income and a better quality of life than those with poor adherence.

Conclusions: Poor adherence to medications is very common in the hypertensive Nigerians. Effective health education and regular screening for compliance and adherence is a potential way to reduce cardiovascular risk associated with uncontrolled hypertension.

PP.40.20 RENAL DAMAGE AND VASCULAR CALCIFICATIONS IN HYPERTENSIVE PATIENTS

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Objective: Uric acid, creatinine and glomerular filtration rate (GFR) values are useful parameters of renal dysfunction in hypertension. The study aimed to estimate the arterial calcification by correlating serum levels of osteoprotegerin (OPG) and nuclear factor kappa B ligand (RANKL) with renal indicators in hypertensive patients with or without coronary artery disease (CAD).

Design and method: The present study was conducted on 223 hypertensive patients divided in two groups: with or without CAD, based on angiographically evidence. The groups were compared to a CONTROL group of 74 healthy subjects. Serum uric acid, creatinine and glomerular filtration rate (GFR) were evaluated in all groups. Serum levels of OPG and RANKL were determinated by ELISA. Chronic Kidney Disease Epidemiology Collaboration formula was used to estimate GFR.

Results: The values of uric acid were significantly higher in hypertensive patients with CAD than in hypertensive patients without CAD and in the CONTROL group (6.3±1.85 vs 5.8±1.78 vs 4.7±1.19 mg/dl, all p<0.001). A significantly positive correlation between serum uric acid values and OPG (r=0.637, p<0.001) and a negative correlation with RANKL (r=-0.287, p<0.001) was observed. The correlation between OPG/RANKL ratio and uric acid levels was significantly positive (r =0.312, p<0.001). Serum creatinine was significantly positive correlated to OPG (r=0.210, p<0.001) and negatively correlated to RANKL (r=-0.285, p<0.001). A significantly negative correlation between GFR and OPG (r=-0.596, p<0.001) and a positively one between GFR and RANKL (r= 0.301, p<0.001) was obtained.

Conclusions: The renal damage evaluated by serum uric acid, creatinine and GFR values is significantly associated with the progression of vascular calcification in hypertensive patients.

PP.40.21 INCREASE IN SERUM URIC ACID CONCENTRATION AFTER ADMINISTRATION OF LOW-DOSE THIAZIDE DIURETICS WAS ASSOCIATED WITH DECLINE IN RENAL FUNCTION

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Objective: Most of the evidences demonstrated that low-dose thiazide diuretics reduce mortality and morbidity in hypertensive patients. However, low-dose thiazide diuretics failed to reduce coronary events in patients whose serum uric acid (SUA) increased more than 0.06 mmol/l after initiation of the diuretic therapy in the Systolic Hypertension in the Elderly Program (SHEP). The purpose of this study is to elucidate the factors that are associated with increase in SUA in hypertensive outpatients who were newly prescribed low-dose thiazide diuretics.

Design and method: Study subjects were hypertensive patients who were administered low-dose thiazide diuretics (less than or equal to 25 mg of hydrochlorothiazide) in outpatient clinic of the Hospital of Hyogo College of Medicine. We retrospectively investigated systolic blood pressure (SBP), SUA, and estimated glomerular filtration rate (eGFR: determined by modified Modification of Diet in Renal Disease (MDRD) Study equation for Japan) before (pre-SBP, pre-SUA, and pre-eGFR) and after initiation of thiazide diuretics. We analyzed the relationship between the change in SUA (ΔSUA) and pre-SBP, pre-SUA, pre-eGFR, the change in eGFR (ΔeGFR), and the change in SBP (ΔSBP).

Results: Fifty-nine hypertensive patients (25 females) were included in this study. Patient characteristics were as follows: age 66±11 years, pre-SBP 152±26/83±14 mmHg, pre-SUA 5.8±1.4 mg/dl, and pre-eGFR 59.3±16.7 ml/min/1.73m2 (mean±standard deviation). ΔSUA was correlated to ΔeGFR (R=-0.47,P<0.01) but not to pre-SBP, pre-SUA, pre-eGFR, andΔSBP in univariate analysis. Multivariate analyses also revealed that onlyΔeGFR was independently associated with ΔSUA (p<0.01) among age, sex, pre-SBP, pre-SUA, pre-eGFR,ΔSBP, and ΔeGFR.

Conclusions: Increase in SUA after initiation of low-dose thiazide diuretics was associated with decrease in eGFR. Decline in renal function may be the reason why low-dose thiazides failed to prevent coronary events in patients whose SUA increased in SHEP. Further studies are needed to elucidate that increased SUA is a cause or a result of decline in renal function.

PP.40.22 INVESTIGATION OF RELATIONSHIP BETWEEN URIC ACID AND METABOLIC SYNDROME IN THE GENERAL POPULATION

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Objective: Hyperuricaemia is a risk factor for cardiovascular diseases as well as gouty arthritis.The present study was designed to investigate a relationship between uric acid and metabolic syndrome or its components in the Japanese general population.

Design and method: Serum uric acid levels were measured in 8232 subjects (male=5255, mean age=56.6 years, range 20-91 years) who visited our hospital for a yearly physical checkup from January to December 2012 and a cross-sectional analysis was performed. The metabolic syndrome was defined according to the Japanese criteria (the presence of two or more of the following items in subjects with obesity; (1) elevated triglycerides and/or decreased high density-lipoprotein cholesterol, (2) elevated blood pressure, and (3) elevated fasting plasma glucose). Hyperuricaemia was defined as a serum uric acid level >= 6.0 mg/dL in female and >= 7.0 mg/dL in male subjects, or the use of medications for hyperuricaemia.

Results: Physical checkup revealed that 1510 subjects were with hyperuricaemia (male/female=24.9%/6.8%; among them, 32.2% and 4.9% in male and female subjects, respectively, were under anti-hyperuricaemic medications) and 1209 subjects with metabolic syndrome (male/female=19.8%/5.6%). Uric acid level and the prevalence of hyperuricaemia were significantly higher in subjects with (6.1±1.4mg/dL, 36.1%) than without metabolic syndrome (5.4±1.3mg/dL, 15.3%). The presence of metabolic syndrome was correlated with uric acid levels after adjustment for age, gender, serum creatinine and current smoking (p<0.0001). Multivariate regression analysis revealed that obesity, dyslipidemia, elevated blood pressure, and impaired glucose tolerance were independently correlated with uric acid levels. The uric acid level increased with increasing the number of the component of metabolic syndrome in each individual (without metabolic component, 4.9±1.2mg/dL; 1 component, 5.5±1.3mg/dL; 2 components, 5.8±1.3mg/dL; components>=3, 6.0±1.4mg/dL). Similar results were obtained in sub-analysis of subjects with normal uric acid levels (n=6716) or without any medications (n=5549).

Conclusions: Hyperuricemia was common in male subjects, but only few subjects in both male and female were under medical treatments. There was an independent relationship between uric acid and metabolic syndrome or its components, suggesting a pathophysiological role of uric acid in the development of cardiovascular disease.

PP.40.23 URIC ACID INDUCES KIDNEY EPITHELIAL-MESENCHYMAL TRANSITION: ROLE OF NLRP3 INFLAMMASOME

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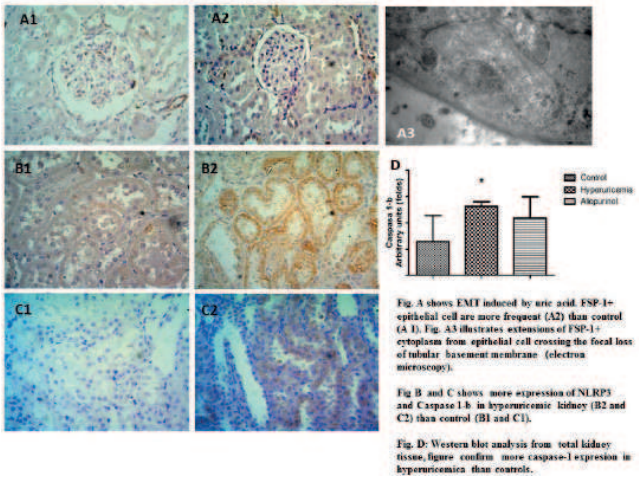
Objective: Recently it has been demonstrated that hyperuricemia induces kidney epithelial-mesenchymal transition (EMT), an early state of renal fibrosis. NLRP3 inflammasome is part of the innate immune response that senses danger cellular signals and mediates an inflammatory response, activating caspasa-1 and finally increasing IL-1b and IL-18. Uric acid activates NLRP3 in vitro. The rol of NLRP3 inflammasome in EMT in hyperuricemic model is unknown.

Design and method: Male 200- to 250-g wistar rats during 49 days were fed ad libitum with standard normosodium diet (C group) (n=4), a second group (n=4) received the same normosodium diet with 2% oxonic acid and 2% uric acid suplements (OXUR group), and finally a third group (AL) received the supplemented hyperuricemic diet, plus allopurinol in drinking water (150 mg/L). At day 49 serum uric acid and blood urea were measured. Kidney material was taken and frozen for western blot (WB), a section was processed for transmission electron microscopy (EM) and finally fixation (4% paraformaldehyde) and paraffin inclusion was performed for immunohistochemistry (IHC) technique with peroxidase, using FSP-1 antibody (Abcam) to detect EMT on epithelial cells, NLRP3 (Santa Cruz) to evaluate the expression of inflammasome, and caspase-1 to measure the activity of inflammasome; we analyzed10 randomized areas at 400x from each animal. Caspasa-1 was measured on WB from total kidney tissue.

Results: OXUR group achieved higher plasma levels of uric acid (2,2±0,5 vs. 0,9±0,7 and 1,4±0,8 mg/dl; p<0,02) and urea (58,7±6 vs. 42±3 and 28,5±1,7; p<0,001) than C and AL group. EMT was confirmed on EM (figure) and on IHC showing more epithelial cell FSP-1+ in the OXUR group than CT (15,4±17 vs 2,6±4 cell/100 tubules; p<0,001). 69% of tubules (n=493) from OXUR group expressed NLRP3 on IHC, while 11% and 16% in the C and AL groups (p<0,001). Caspasa-1 in OXUR group was expressed in 32% of tubules (n=628) while 2% and 3% in the C and AL groups, respectively (p<0,001). This difference was confirmed on WB analysis (figure).



Conclusions: NLRP3 inflammasome, via caspase-1 activation, would participate in kidney epithelial-mesenchymal transition induced by uric acid.

PP.40.24 RELATIONSHIP BETWEEN URIC ACID LEVELS AND SODIUM SENSITIVITY INDEX IN PATIENTS WITH ESSENTIAL ARTERIAL HYPERTENSION

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Objective: Some experimental and clinical studies have shown that high levels of uric acid (hyperuricemia) are one of the main causes of cardiovascular and kidney damage in essential arterial hypertension. Still, an open question remained – whether hyperuricemia plays a key role in initiation of salt-sensitive hypertension?
Having that in mind, the goal of this study was to examine correlation between level of uric acid in serum of patients with essential arterial hypertension and preserved kidney function; and index of sodium sensitivity, as the main parameter of salt-sensitive hypertension existence.

Design and method: The study included 178 patients of both sexes, aged averagely 59±18.2 years, with at least 5 years of hypertension history. Uric acid serum values were measured spectrophotometrically, using ERBA XL 600 automated analyser.
Sodium sensitivity index has been calculated from differences in 24 hours sodium excretion between period of sodium rich diet (250 mmol/24 hours) and sodium lean diet (100 mmol/24 hours), divided by mean arterial pressure, determined in the first and second measurement respectively.
The results were processed using Student's t-test and Pearson's Correlation in Microsoft Excel 2010.

Results: Based on uric acid serum values, patients were divided into 2 groups:
I group – 95 patients, with normal uric acid serum values (256±35 µmol/l);
II group – 83 patients, with statistically significant increase of uric acid serum values (572±49 µmol/l; p<0.01). Sodium sensitivity index in I group had normal values (0.026±0.005), while in II group it was significantly higher (0.078±0.02; p<0.01). This implies that in II group patients salt-sensitive hypertension was present. Comparison of uric acid serum level increase and salt-sensitivity index showed high positive correlation (r=0.721).

Conclusions: In patients with essential arterial hypertension and preserved kidney function, hyperuricemia and salt-sensitivity index correlate highly. This indicates that salt-sensitive arterial hypertension can be induced by prolonged hyperuricemia.

PP.40.25 SERUM URIC ACID IS ASSOCIATED WITH NON-DIPPING CIRCADIAN PATTERN IN YOUNG PATIENTS (30-40 YEARS OLD) WITH NEWLY DIAGNOSED ESSENTIAL HYPERTENSION

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Objective: Uric acid (UA) is independently associated with newly diagnosed hypertension. Nocturnal non-dipping pattern evaluated by the 24-hour ambulatory blood pressure monitoring (ABPM) is associated with a greater risk of cardiovascular, renal, and cerebrovascular complications than dippers. We aimed at evaluating the relationship between the circadian blood pressure rhythm and UA level in young patients (30-40 years old) with newly diagnosed essential hypertension.

Design and method: The study included 62 essential hypertensive patients and 29 healthy controls. The hypertensive patients were divided into two groups according to the results of 24-hour ABPM, including 30 dippers (20 men, 10 women; mean age 34±2 years) and 32 non-dippers (18 men, 14 women; mean age = 33±3 years).

Results: Compared to the dippers and to healthy controls, non-dippers had significantly higher serum UA levels (6.1±0.7, 5.2±0.9 and 4.1±0.9 mg/dl, respectively; P<.001). After adjusting for age, gender, body mass index, and comorbidity (history of cardiovascular disease, diabetes, hypercholesterolemia), multivariate logistic regression analysis revealed an independent association between serum UA levels and non-dipper pattern (odds ratio = 2.44; 95% confidence interval = 1.4-4.1; P = .002).

Conclusions: Serum UA is independently associated with non-dipper circadian pattern in young patients with newly diagnosed essential hypertension.

PP.40.26 THE ASSOCIATION OF URIC ACID WITH RISK OF HYPERTENSION IS MODULATED BY PHYSICAL ACTIVITY

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Objective: The association of uric acid with risk of hypertension is controversial and may be modulated by other risk factors. We did a prospective study to investigate whether uric acid was an independent predictor of risk of hypertension in the young and whether an unhealthy lifestyle could favour this association.

Design and method: The study was conducted in a cohort of 1060 young to middle age subjects screened for stage 1 hypertension and followed for a median of 11 years. In multivariable Cox analyses, data were adjusted for age, gender, body mass index (BMI), parental hypertension, 24-hour systolic and diastolic blood pressure, serum creatinine, lifestyle factors and metabolic data.

Results: At baseline uric acid showed an independent positive association with male gender, BMI, creatinine and metabolic data and a negative association with age and smoking. The uric acid level was 5.03 mg/dL in the sedentary subjects (n=659) and 5.00 mg/dL in the active subjects (p=n.s.). At follow-up end, 677 subjects developed hypertension needing treatment. In the whole group, uric acid was an independent predictor of future hypertension (p=0.004). Participants with uric acid > 5.60 mg/dL (lower limit of the top tertile) had a 31% increase in risk compared to those of the bottom tertile. However, the risk of hypertension related to uric acid was increased only among the sedentary subjects (p=0.0017) with a hazard ratio of 1.43 (95%CI, 1.10-1.88) for the subjects of the top uric acid tertile compared to those of the bottom tertile. In contrast, among the active subjects no association was found between uric acid and risk of hypertension (p=0.56). The association between uric acid and future hypertension remained virtually unchanged when baseline serum glucose, cholesterol and triglycerides were included in the regression models.

Conclusions: Uric acid is an independent predictor of hypertension in young to middle age subjects. However, regular physical activity prevents the development of hypertension related to hyperuricemia. These data suggest that exercise can counteract the pathophysiological mechanisms involved in the association between hyperuricemia and development of hypertension.

PP.40.27 HYPERURICEMIA AND REDUCED VITAMIN D ARE ASSOCIATED TO THE MICROVASCULAR DAMAGE ALONG THE ONSET OF THE METABOLIC SYNDROME

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Objective: Diminished vitamin D and elevated uric acid plasma levels have been associated to the onset of cardiovascular disease. Aim of the study was to highlight their association with the subclinical vascular damage in patients with a recent diagnosis of grade 1 primary hypertension.

pts/var	VitD	Uricemia	nATPIII	HOMA	PWV	CVC
NDNU	29.9±6.9	4.3± 8	1.9± 9	2.3±1.6	9.8±1.1	66.6±5.9
LDNU	6.5±4.3***	4.1± 8	2.1±1.2	2.6±1.6	10.1±1.3	47.6±1.3***
NDHU	31.3±9.1^^^	6.5± 8***^^^	2.6±1.2***^	2.9±1.6	10.2±1.2	46.2±1.2***^^^
LDHU	15.2±4.4***°°°	6.5± 9***^^^	2.5±1.1***^	3.7±2.1***^^^	11.4±1.4***^^^	41.5±3.1***^^^°°°

Design and method: By means of insulin resistance (HOMA), factors of metabolic syndrome (nATPIII) and ABPM, 200 mild hypertensives (133±13/82±9), 70 with normal (N) Vit.D (D) and uricemia (U), 68 with reduced (L) D, 31 with high (H) U and 31 with both the disorders (LDHU) underwent to the arterial stiffness exam (PWV) and videocapillaroscopy of the medial and distal phalanx of the 2nd, 3rd and 4th finger of the non-dominant hand in venous congestion as index of structural microvascular damage (CVC).

Results: Patients showed a similar hypertensive state in the office and during ABPM. Data are showed as m±s.d.(*:p<.05, **:p<.01, ***:p<.001 vs NDNU; ^:p<.05, ^^:p<.01, ^^^:p<.001 vs LDNU;°p<.05, °°:p<.01, °°°:p<.001 vs NDHU).
Pearson test, adjusted for age and history of hypertension, showed a significant association between nATPIII and D (-.176*), U (.228**), PWV (.309**) and CVC (-.248**).

Conclusions: The findings suggest that the reduced Vit D and the hyperuricemia, per se, are associated to the structural microcirculatory damage along with the clustering of the factors of the metabolic syndrome before the onset of arterial stiffness. Later, the raised PWV is coupled with severe capillary rarefaction, insulin-resistance and both LD and HU.

PP.40.28 THE SIGNIFICANCE OF URIC ACID IN CARBOHYDRATE METABOLISM IN ESSENTIAL HYPERTENSIVE PATIENTS

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Objective: Aim of our study was to evaluate the relationship between uric acid levels with parameters of carbohydrate metabolism in essential hypertensive patients.

Design and method: We studied 2577 consecutive newly diagnose, treated or untreated, hypertensive patients (46% male, age 57 years, mean systolic/diastolic blood pressure: 156/98,7 mmHg, BMI 28,1 kg/m2, waist circumference: 96,3 cm), without overt cardiovascular disease. In all participants uric acid levels and parameters of carbohydrate metabolism (fasting glucose, insulin, c-peptide, HBA1c) were measured in venous blood sample. Moreover, in 897 participants oral glucose tolerance test was performed and HOMA-IR index was calculated.

Results: Results are shown in Tables 1-3.

Table 1. Comparisons between treated or untreated hypertensive patients

	Untreated	Treated	p value
Uric acid (mg/dl)	4,9±1,5	5,4±1,6	<0,001
Fasting glucose (mg/dl)	98,3±24	107,9±29	<0,001
insulin (mU/l)	12,3±12	12,6±12	NS
c-Peptide (ng/ml)	2,2±1,5	2,7±1,9	0,007
HBA1c (%)	5,55±1	5,97±1,1	<0,001
HOMA-IR	3±2,9	3,4±3,8	0,099

Table 2. Correlations between uric acid levels and parameters of carbohydrate metabolism

	Pearson r	p value
Fasting Glucose	0,084	<0,001
Insulin	0,121	0,001
c-Peptide	0,293	<0,001
HBA1c	0,980	0,002
HOMA-IR	0,118	0,001

Table 3. regression analysis with dependent variable uric acid levels

	P value
HBA1c	0,002
c-Peptide	0,013
HOMA-IR	0,015

Conclusions: In essential hypertensive patients uric acid levels are significantly dependent by parameters of carbohydrate metabolism and insulin resistance, possibly playing an important role in the development of metabolic syndrome or being part of the problem.

PP.40.29 PROGNOSTIC VALUE OF SERUM URIC ACID LEVELS TO THE CARDIOVASCULAR EVENTS IN HYPERTENSIVES

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Objective: Aim of the study was to investigate the role of serum uric acid levels to the cardiovascular events in hypertensive patients.

Design and method: This is a prospective analysis including 687 hypertensive patients (mean age at the entry: 55,5±11,9 years, mean office systolic/diastolic

blood pressure: 149,8±21/93,1±12,3, mean office heart rate: 75,9±12 beats/min). The follow-up period was 9,6±6,3 years. Serum uric acid levels (UA) were measured at the entry of the study. Major cardiovascular events (MACE) (myocardial infarction, stroke, cardiovascular death) were registered. We estimated the prognostic value of UA to the MACE. Cox proportional hazard model were employed to determine the prognostic value of uric acid.

Results: The follow-up period was 9,6 years. There were 262 (38,1%) MACE at the end of the study. Cox regression statistical analysis revealed that uric acid was a predictor of MACE (HR: 1,13, 95%CI: 1,04 – 1,2, p-value=0,0038) (Table 1).

Table 1. Hazard ratio for uric acid in entire cohort

	Hazard ratio	95% Confidence Intervals	P value
Uric Acid	1,13	1,04 – 1,2	0,0038

Conclusions: Serum uric acid levels have prognostic value to major cardiovascular events in hypertensive patients.

PP.40.30 EFFECTS OF ALLOPURINOL ON RENAL FUNCTION DECLINE IN HYPERTENSIVE PATIENTS WITH CHRONIC KIDNEY DISEASES

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Objective: To evaluate retrospectively the effects of allopurinol treatment on renal function decline in non-gouty hyper- tensive patients with moderate-to-severe CKD.

Design and method: We selected 22 patients treated with allopurinol (A) (100–300 mg/die) that were compared with 44 subjects not treated with this drug (B), matched with A for esti- mated glomerular filtration rate (eGFR), age, gender and blood pressure values.

Results: After a mean follow-up period of 16 months no significant difference was observed between the two groups regarding eGFR decline (A: -6.8 ± 11.6 ml/min/1.73 m2; B: -4.2 ± 9.3 ml/min/1.73 m2). Furthermore, the per- centage of subjects with a value of eGFR reduction above the median was not significantly different in the two groups (A: 59 %; B: 41 %; p = 0.16). The absence of a significant effect of allopurinol on the eGFR decline was confirmed by the multiple logistic regression analysis, where the vari- ables associated with a greater eGFR reduction were the proteinuria and the baseline value of GFR.

Conclusions: Our findings are in disagreement with pre- vious studies showing a nephroprotective effect of allo- purinol. Further studies, with a randomized controlled design, are needed to understand whether or not pharma- cological treatment of asymptomatic hyperuricemia may preserve renal function.

PP.40.31 RELATIONSHIP BETWEEN ASYMPTOMATIC HYPERURICEMIA AND RENAL FUNCTION DECLINE IN HYPERTENSIVE SUBJECTS

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Objective: To evaluate retrospectively the relationship between asymptomatic hyperuricemia and renal function decline in non-gouty hypertensive patients.

Design and method: We enrolled 97 hypertensive subjects, 48 with chronic kidney diseases and 49 without CKD. Fifty-seven of them had normal serum uric acid level (lower than 7 mg/dl in men and 6 mg/dl in women) and 40 had hyper uricemia. Patients with hyper uricemia had higher systolic blood pressures and lower estimated glomerular filtration rate (eGFR) than N. At the end of follow-up period (mean: 16 months), eGFR reduction was similar in the two groups (N: -3.6 ± 12.3; U: -3 ± 13.4 ml/min/ 1.73 m2).

Results: Two-way ANOVA showed that this result was not influenced by renal dysfunction, diabetes, macroproteinuria, gender or smoking habit. The percentage of subjects with a value of eGFR reduction above the median was not significantly different in the two groups (N: 24.6 %; U: 27.5 %). The absence of a significant difference between the two groups, regarding the eGFR decline was confirmed by the multiple logistic regression analysis, where the variables associated with a greater eGFR reduction were only the proteinuria and the smoking habit.

Conclusions: Our findings do not support the hypothesis of a significant effect of asymptomatic hyperuricemia on the renal function decline in subjects with arterial hypertension.

PP.40.32 URIC ACID IS PREDICTIVE OF ALL-CAUSE AND CARDIOVASCULAR MORTALITY IN THE ELDERLY SUBJECTS: THE TAIPEI ELDERLY HEALTH EXAMINATION COHORT

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Objective: High serum acid (SUA) is suggested to be causally involved in the pathogenesis of vascular disease. The current study aimed to investigate whether SUA independently predicts all-cause and cardiovascular mortality in a large Taiwanese elderly cohort.

Design and method: In 2001, 43,594 Taipei City elderly citizens had received free Physical Health Examination (PHE) at hospitals in Taipei and had been followed up until the end of 2010. The PHE included medical history, physical examination and routine blood, urine and stool laboratory tests. Among them, 39,143 subjects agreed to participate in this study. There was a follow- up for all-cause and cardiovascular mortality with a mean duration of 8.5 years. Chi square and analysis of variance (ANOVA) were used to examine the association between covariates and SUA, as appropriate. Cox regression model was applied to evaluate the risk of all-cause and cardiovascular mortality across the quartiles of SUA while controlling for other covariates.

Results: During the follow-up period, 8368 (21.38%) died and 1376 died from cardiovascular disease. Body mass index, fasting glucose, cholesterol and triglyceride increased across the quartiles of SUA (Table 1). In contrast, glomerular filtration rate was inversely related to the quartiles of SUA. Adjusting for age and sex, subjects in the fourth SUA quartile had increased all-cause (hazard ratio (HR)=1.24; 95% CI:1.16-1.32) and cardiovascular (HR=1.46; 95% CI:1.25-1.70) mortality compared to individuals in the first quartile. These associations even stronger after including additional covariates such as BMI, fasting glucose, GFR, systolic pressure, total cholesterol and triglyceride into the model (Table 2).

Table 1: Baseline characteristics according to quartile of serum uric acid

	Serum uric acid quartile (mg/dL)				
	0.2-5.2	5.3-6.2	6.3-7.4	>7.4	P
Glomerular filtration rate (ml/min/1.73m2)	71.27±22.65	68.27±15.65	65.01±18.69	59.72±16.87	<0.0001
Body Mass Index (kg/m2)	23.44±3.23	24.04±3.22	24.50±3.17	25.01±3.18	<0.0001
Systolic pressure	139.43±25.00	134.88±19.06	135.62±23.28	135.60±25.38	<0.0001
Fasting glucose (mg/dL)	105.13±27.72	105.60±24.92	105.98±23.66	107.90±23.72	<0.0001
Total cholesterol (mg/dL)	198.73±35.80	198.99±35.58	199.49±35.43	200.69±35.90	0.0008
Triglyceride (md/dL)	109.12±59.54	117.77±62.76	124.93±66.00	140.28±72.11	<0.0001

Table 2: Mortality according to quartile of serum uric acid

Uric acid	Model 1		Model 2		Model 3	
Quartile	HR (95% CI)	P	HR (95% CI)	P	HR (95% CI)	P
1st	1.0 reference (all-cause)		1.0 reference		1.0 reference	
2nd	1.08 (1.02-1.15)	0.0144	0.99 (0.93-1.05)	0.7338	1.04 (0.96-1.12)	0.3423
3rd	1.12 (1.05-1.19)	0.0005	0.98 (0.92-1.04)	0.4968	1.10 (1.02-1.18)	0.0171
4th	1.46 (1.37-1.55)	<.0001	**1.24 (1.16-1.32)**	<.0001	**1.37 (1.27-1.48)**	<.0001
1st	1.0 reference (CVA)		1.0 reference		1.0 reference	
2nd	1.17 (0.99-1.37)	0.0611	1.06 (0.90-1.25)	0.4714	1.19 (0.98-1.45)	0.0778
3rd	1.29 (1.10-1.51)	0.0015	1.13 (0.97-1.33)	0.1256	1.35 (1.12-1.64)	0.0021
4th	1.71 (1.47-1.99)	<.0001	**1.46 (1.25-1.70)**	<.0001	**1.60 (1.32-1.94)**	<.0001

Conclusions: High SUA independently increased the risk for all-cause and cardiovascular mortality in Taiwanese elderly cohort receiving PHE.

PP.40.33 ASSOCIATION BETWEEN HYPERURICEMIA AND HYPERTENSION IN PATIENTS WITH ISCHEMIC HEART FAILURE. EFFECTS OF THIAZIDE DIURETICS

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Objective: Association between hyperuricemia and hypertension has been recognized a long time ago, with the prevalence of hyperuricemia of about 20-40% in hypertensive subjects. Diuretics, such as thiazides, increase serum uric acid which is the reason for rise in the prevalence of hyperuricemia up to 58% in hypertensive patients. Finding that ischemia results in an increase in uric acid levels may account for why uric asid could be increased in heart failure. Aim was to investigate the association of hyperuricemia to hypertension and diuretics use in patients with ischemic heart failure.

Design and method: This prospective research included 150 patients with heart failure of ischemic etiology, treated in Clinic of Cardiology, University Clinical Center Kragujevac from June 2010-June 2011. We collected anamnestic data on prior hypertension and use of antihypertensive therapy, and proof of thiazide diuretics use from therapy lists. Blood pressure was measured on admission after 5 minutes of rest in a supine position, to confirm the presence of hypertension. Serum uric acid was measured in local laboratory on admission and before discharge. All data were stored in a specially designed database, and statistically analyzed in the SPSS for Windows.

Results: Prior hypertension was present in 115 patients (76.7%; x2-test;p=0.000) with only 40% on prior antihypertensive therapy. Thiazide diuretics were applied in 113 patients (75.3%; x2-test;p=0.000). Serum uric acid was elevated in 76 patients (50.7%) in a total group (x2 test; p=0.027), with a mean value 455.39±154.7 µmol/L on admission. Subgroups of patients with prior hypertension, antihypertensive therapy, and diuretis had high uric acid in 69.7%, 35.5% and 76.3%. Levels increased during hospitalization to 468.08±160.07 µmol/L, so on discharge 81 patient (54%) had hyperuricemia with no statistical significance (paired t-test; p=0.104). Elevated serum uric acid was connected positively to prior hypertension and use of diuretics (Person's coeficient 0.166 and 0.023).

Conclusions: Hyperuricemia showed important association to hypertension in patients with ischemic heart failure with levels increasing during hospitalization, which can be attributed to a combination of ischemia, leading to heart failure, and use of thiazide diuretics which led to deterioration.

PP.40.34 ASSOCIATION BETWEEN SERUM URIC ACID, CAROTID ATHEROSCLEROSIS AND METABOLIC SYNDROME IN KOREAN POPULATION

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Objective: Metabolic syndrome indicates an increased cardiovascular risk. In addition, previous studies have suggested that hyperuricemia may be a risk factor for cardiovascular diseases. However, there are few data available on possible independent association between uric acid and carotid atherosclerosis. The objective of the present study was to access the association of uric acid with prevalence of carotid atherosclerosis according to gender and metabolic syndrome.

Design and method: The subjects consisted of 1132 patients who visited cardiology department at our hospital between 2007 and 2009. In all the subjects, we performed a survey on demographic and cardiovascular risk factors and determined blood pressure, body mass index, waist and laboratory, and echocardiographic parameters. This study was used ATP III definition for the metabolic syndrome.

Results: The patients were 567 men and 565 women (50:50%) with mean age of 61.4 years and mean body mass index of 24.5kg/m2. The prevalence of the metabolic syndrome was 42.8%, predominantly among women (women: 58.4%, men: 41.6%). The mean values of serum uric acid and carotid intima-media thickness (IMT) were 5.3 mg/dL (men: 5.7 mg/dL, women: 4.9 mg/dL, p<0.001) and 0.80 mm (men: 0.77 mm, women: 0.82 mm, p=0.004). After adjusting for age, gender, smoking status, total cholesterol, C-reactive protein, renal function and ejection fraction, the odds ratios (95% CI, p value) of serum uric acid and carotid IMT for metabolic syndrome were 1.26 (1.13-1.40, p<0.001) and 3.43 (1.85-6.35, p<0.001). According to gender, the adjusting the odds ratios (95% CI, p value) of serum uric acid and carotid IMT for metabolic syndrome were 1.26 (1.08-1.48, p=0.003) and 4.92 (1.89-12.79, p=0.001) in women, in addition, 1.29 (1.12-1.50, p=0.001) and 2.53 (1.10-5.79, p=0.028) in men.

Conclusions: There was higher prevalence of metabolic syndrome as expected in Korean population. The prevalence of metabolic syndrome showed an increase according to serum uric acid values and carotid IMT in both genders. The metabolic syndrome might be significantly associated with hyperuricemia and carotid atherosclerosis.

PP.40.35 SERUM URIC ACID IS ASSOCIATED WITH CORONARY ARTERY CALCIFICATION

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Objective: Uric acid (UA) is associated with coronary artery disease. Coronary artery calcium (CAC) is a marker of atherosclerotic disease and a predictor of cardiovascular events. The aim of the present study is to evaluate whether UA levels are associated with CAC.

Design and method: The study included 663 asymptomatic subjects (564 males, mean age 55+7 years) who underwent a routine evaluation for the presence of CAC with ungated dual slice computed tomography (CT) between the years 2001-2002. Data on patient's medical history, physical examination and laboratory evaluations including UA levels were collected. Study population was divided into three tertiles according to their UA levels and the prevalence of CAC was compared between the tertiles.

Results: Coronary artery calcium was detected in 349 (53%) subjects. Levels of UA were significantly higher in those with than in those without CAC (5.6 + 1.2 vs. 5.3 + 1.3; p = 0.003). The rate of CAC was significantly higher in the highest UA tertile than in the lowest tertile (59% vs. 46%; p = 0.005). The odds ratio for the presence of CAC in the highest vs. lowest UA tertile was 1.72 [95% confidence interval (CI), 1.17-2.51]. After adjusting for age, gender, hypertension, diabetes mellitus, hyperlipidemia, body mass index, creatinine levels, the highest UA tertile was associated with the presence of CAC with an odds ratio of 1.84 (95% CI 1.1-3.07).

Conclusions: Increasing serum UA levels are associated with the presence of CAC.

PP.40.36 SERUM URIC ACID AND ARTERIAL STIFFNESS IN HYPERTENSIVE CHRONIC KIDNEY DISEASE PATIENTS: GENDER-SPECIFIC VARIATIONS

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Objective: Hyperuricemia and arterial stiffness are associated with increased cardiovascular risk. Specific relationship between arterial stiffness and serum uric acid (SUA) in chronic kidney disease (CKD) patients has not been investigated. We investigated whether SUA level is associated with arterial stiffness in hypertensive CKD patients.

Table1. Association of PWV and AIx@75 with serum uric acid in the study population.

Parameter	Whole Population			Female			Male		
	β	95 % CI	P	β	95 % CI	P	β	95 % CI	P
24-hour AIx@75 (%)									
Unadjusted	-0.192	-1.367-(-0.458)	<0.001	0.053	-0.018-0.039	0.467	-0.186	-0.067-(-0.003)	0.021
Adjusted*	-0.158	-1.467-(-0.186)	0.012	-0.046	-1.222-0.766	0.652	-0.299	-2.507-(-0.557)	0.002
Daytime AIx@75 (%)									
Unadjusted	-0.204	-1.608-(-0.514)	<0.001	0.016	-0.025-0.032	0.827	-0.188	-0.067-(-0.003)	0.023
Adjusted*	-0.147	-1.412-(-0.114)	0.021	-0.035	-1.177-0.825	0.728	-0.292	-2.498-(-0.506)	0.003
Nighttime AIx@75 (%)									
Unadjusted	-0.133	-1.564-(-0.174)	0.014	0.131	-0.002-0.043	0.070	-0.164	-0.050-(-0.001)	0.047
Adjusted*	-0.160	-1.823-(-0.269)	0.008	-0.040	-1.422-0.916	0.668	-0.272	-2.960-(-0.373)	0.004
24-hour PWV (m/s)									
Unadjusted	0.223	0.109-0.307	<0.001	0.280	0.134-0.398	<0.001	0.071	-0.105-0.262	0.398
Adjusted*	-0.019	-0.078-0.043	0.570	-0.015	-0.115-0.083	0.755	-0.023	-0.111-0.070	0.657
Daytime PWV (m/s)									
Unadjusted	0.221	0.107-0.305	<0.001	0.271	0.125-0.391	<0.001	0.075	-0.100-0.266	0.372
Adjusted*	-0.022	-0.081-0.041	0.521	-0.022	-0.121-0.076	0.654	-0.018	-0.107-0.076	0.732
Nighttime PWV (m/s)									
Unadjusted	0.220	0.108-0.308	<0.001	0.298	0.0149-0.409	<0.001	0.054	-0.122-0.239	0.524
Adjusted*	-0.023	-0.085-0.043	0.521	0.004	-0.101-0.110	0.931	-0.044	-0.134-0.054	0.398

S.E.; Standard error, CI; Confidence interval. AIx@75, Augmentation index adjusted for heart rate, PWV; Pulse wave velocity.

*Adjusted for age, gender (only for whole population analysis), smoking, diabetes mellitus, coronary artery disease, cerebrovascular disease, peripheral arterial disease, use of statin and antihypertensive drugs, total cholesterol and triglyceride, urinary protein excretion rate and estimated glomerular filtration rate.

Design and method: Study had a single-center, cross-sectional design. Methods: 339 hypertensive CKD patients (female/male; 192/147, mean age; 57.9±13.9 years) were recruited. Arterial stiffness was assessed by pulse wave velocity (PWV) and augmentation index adjusted for heart rate (AIx@75).

Results: SUA was negatively correlated nighttime wave reflection magnitude (P:0.015), 24-hour AIx@75 (P<0.0001), daytime AIx@75 (P<0.0001) and nighttime AIx@75 (P:0.014), and was positively correlated with 24-hour PWV (P<0.0001), daytime PWV (P<0.0001) and nighttime PWV (P<0.0001). SUA was negatively correlated with 24-hour AIx@75 (P:0.024), daytime AIx@75 (P:0.023) and nighttime AIx@75 (P: 0.047) in males, whereas SUA was positively correlated with 24-hour PWV (P<0.0001), daytime PWV (P<0.0001) and nighttime PWV (P<0.0001) in females. In adjusted analysis, SUA was independently associated with AIx@75, but not with PWV. In gender-specific unadjusted analysis, SUA was significantly associated with PWV only in females, which lost significance in adjusted analysis. SUA was significantly associated with AIx@75 in only males, which remained significant after adjustment for confounders.

Conclusions: In hypertensive CKD patients, SUA was correlated with the two indices of arterial stiffness, PWV and AIx@75, with gender-specific variations. However, SUA was independently associated with only AIx@75, but not with PWV, in the whole patient population and only in males.

PP.40.37 URIC ACID PREDICTS LONGITUDINAL BLOOD PRESSURE INCREASE AND NEW-ONSET HYPERTENSION IN THE GENERAL POPULATION

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Objective: Hyperuricaemia is highlighted as a proposed risk factor for cardiovascular diseases. We recently reported that uric acid is a risk factor for reduced glomerular filtration rate and that reduction in glomerular filtration rate promotes an increase in blood pressure in the general population. Thus, hypertension may underlie the pathway from hyperuricaemia to cardiovascular disease. The present study therefore investigated whether uric acid levels could be a predictor of the longitudinal increase in blood pressure and the future development of hypertension in the general population.

Design and method: Normotensive individuals (50.7 ± 12.2 years old, n = 8157) were enrolled in the present study. After baseline evaluation, subjects were followed-up for a median of 4 years with the endpoint being the development of hypertension. The impact of uric acid at baseline on the longitudinal increase in blood pressure and the future development of hypertension was assessed.

Results: The actual follow-up period of the present study was 32478 person-years. During the follow-up period, hypertension developed in 2074 subjects (25.4%; 63.9 per 1 000 person-years) with a higher incidence in males (29.5%; 73.2 per 1000 person-years) than in females (19.0%; 48.8 per 1000 person-years). Incident hypertension was increased across the quartiles for baseline uric acid levels ($p < 0.0001$). In multivariate Cox proportional hazards analysis where the baseline uric acid concentration was taken as a continuous variable, uric acid was an independent predictor of the development of hypertension in both male and female subjects ($p < 0.05$). Furthermore, uric acid was independently correlated with the longitudinal increase in blood pressure ($p < 0.05$).

Conclusions: The uric acid level is an independent predictor of future blood pressure and new-onset hypertension in both men and women in the general population. This suggests that uric acid plays a pathophysiological role in the development of hypertension.

PP.40.38 SERUM URIC ACID RELATES WITH EJECTION FRACTION IN ELDERLY OUTPATIENTS AFFECTED BY HYPERTENSION RELATED CHRONIC HEART FAILURE

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Objective: An increasing body of evidence suggest that serum uric acid (SUA) is a cardiovascular disease risk factor, however only preliminary data support the hypothesis that it could be also involved in the prognosis of chronic heart failure. Our aim was to evaluate the relationship between SUA and left ventricular ejection fraction (EF) in a large cohort of outpatients affected by hypertension related heart failure.

Design and method: For this study, from the general cohort of patients followed by the heart failure outpatient clinic of the Bologna University Hospital, we consecutively selected 487 outpatients affected by hypertension related heart failure (M= 291, 59.8%; F= 196, 40,2%; mean age: 72±11 years old).

Results: In an univariate analysis SUA appears to have an inverse strong relationship with EF: B= -4.392, 95%CI -5,427 - -3,357, p<0.001). When including in a multivariate analysis age, BMI, medium arterial pressure (MAP), heart rate, haemoglobin, fasting plasma glucose, LDL-cholesterol, HDL-cholesterol, and creatinine, the model best predicting FE included only SUA (B= -3.005, 95%CI -4,386 - -1,623, p<0.001) and MAP (B= 0.241, 95%CI 0,047 - 0,435, p=0.015). Repeating the analysis by sex, we confirmed that SUA was a significant strong predictor of EF in men, but not in women (where MAP and BMI were the best predictors). Repeating the analysis on the basis of the obesity level, we did not find any difference in the ability of SUA to predict EF in slim patients as in obese ones.

Conclusions: SUA seems to be inversely related to EF in elderly patients affected by heart failure, after correction for a large number of clinical variables, especially in men.

PP.40.39 SERUM URIC ACID AND MARKERS OF LDL-OXIDATION IN A LARGE SAMPLE OF OVERALL HEALTHY SUBJECTS: DATA FROM THE BRISIGHELLA HEART STUDY

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Objective: Serum uric acid (SUA), an inexpensive and standardized marker of systemic oxidative stress, has been recently associated to the risk to develop atherosclerosis-related cardiovascular events. Our aim was to evaluate the eventual relationship between SUA, oxidized LDLs and LDL susceptibility to oxidation in a relatively large sample of non-smokers healthy subjects.

Design and method: We selected from the general database of the Brisighella Heart Study a sample of 354 non-smokers and non-pharmacologically treated young subjects (age included between 20 and 55 years), in primary prevention for cardiovascular disease, without known allergic nor rheumatological disease (including gout), not assuming antioxidant dietary supplements, visited during the 2008 population survey. A full set of clinical and ematochemistry parameters has been evaluated together with oxidative susceptibility of LDL and oxidized LDL dosage level.

Results: In the multivariate analysis, the LDL lag phase was inversely related to apo B (B= -0.166, 95%CI -0.259 - -0.073, p= 0.001) and FPG (B= -0.254, 95%CI -0.471 - -0.037, p= 0.022). The propagation phase was directly related to age (B= 0.117, 95%CI 0.025 - 0.209, p= 0.013) and inversely to TG (B= -0.021, 95%CI -0.038 - -0.004, p= 0.015). The dienes level was directly related to LDL-C (B= 0.685, 95%CI 0.347 - 1.023, p<0.001), SUA (B= 2.201, 95%CI 1.117 - 5.285, p<0.001) and ApoB (B= 0.717, 95%CI 0.404 – 1.031, p<0.001) level. The oxLDL level was directly related to apo B (B= 0.077, 95%CI 0.015 - 0.139, p=0.016), TG (B= 0.050, 95%CI 0.032 - 0.069, p<0.001), LDL-C (B= 0.102, 95%CI 0.052 - 0.153, p<0.001) and SUA (B= 1.106, 95%CI 0.405 - 1.807, p=0.002).

Conclusions: In a sample of healthy subjects SUA is a significant predictor of ox-LDL and dienes level, but not of LDL lag phase and propagation phase.

PP.40.40 SERUM URIC ACID AND OTHER SHORT-TERM PREDICTORS OF ECG ALTERATIONS IN A LARGE SAMPLE OF GENERAL POPULATION: A 4-YEAR FOLLOW-UP OF THE BRISIGHELLA HEART STUDY HISTORICAL COHORT

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Objective: Recent studies show an involvement of SUA as a significant predictor of atrial fibrillation. while its association with other kind of arrhythmias is not yet established. We aimed to evaluate the incidence of the most common electrographic alterations in a large sample of general population and their association with SUA.

Design and method: We selected a Brisighella Heart Study cohort sample of 1557 subjects (M: 47,3%, F: 52,7%), consecutively visited in the 2004 and 2008 population surveys, in a setting of primary prevention for cardiovascular disease and without a known diagnosis of arrhythmia or left ventricular hypertrophy, excluding subjects affected by gout or taking any antihyperuricemic agent or drugs able to interfere with the QT interval, as well as beta-blockers or non-dihydropyridine calcium channel blockers. A step-wise Cox regression analysis was used to determine the independent prognostic significance of age, gender, physical activity, smoking habit, BMI, FPG, mean arterial pressure, heart rate, LDL-C, HDL-C, TG, SUA and eGFR for ECG alterations on a 4-year follow-up.

Results: No one of the considered variables was associated with the incident diagnosis of sinus tachycardia, and sinus bradycardia. Predictors of incident tachyarrhytmias were age (OR 1,08, 95%CI 1,02-1,14, p=0.010), women sex (OR 1,31, 95%CI 1,12-1,86, p=0.022), active smoking (OR 1,18, 95%CI 1,03-1,38, p=0.009) and SUA (OR 1.05, 95%CI 1.01-1.09, p=0.042). Incident ECG signs of previous myocardial infarction were predicted by male sex (OR 1,49, 95%CI 1,18-1,98, p=0.002), active smoking (OR 1,33, 95%CI 1,14-1,59, p=0.004), LDL-Cholesterol (OR 1,29, 95%CI 1,07-2,11, p=0.021) and SUA (OR 1,12, 95%CI 1,01-1,28, p=0.039). Predictors of incident ECG-diagnosed left ventricular hypertrophy were BMI (OR 1,19, 95%CI 1,01-1,26, p=0.041), MAP (OR 1,49, 95%CI 1,22-2,03, p=0.009), and SUA (OR 1,39, 95%CI 1,13-1,88, p=0.019).

Conclusions: In a cohort of general population, SUA seems to be a significant middle-term predictor of electrocardiographically diagnosed myocardial infarction, left ventricular hypertrophy and tachycarrhytmias.

PP.40.41 THE SELECTIVE EFFECT OF LOSARTAN ON URIC ACID DEPENDIG ON ITS INITIAL SERUM LEVEL

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Objective: To examine influence of losartan and its combination with different doses of hydrochlorothiazide (HTZ) on serum uric acid level in hypertensive patients in primary care practice.

Design and method: The open multicenter clinical study LAURA (Losartan And URic Acid) was performed by 98 primary care physicians in 25 cities of Ukraine. The study included 505 outpatient patients, including 165 men (33%) and 340 women (67 %) (mean age 60,9±5,0 years). Losartan was assigned for 170 pts at a mean dose 78,5 mg/day, losartan 50 mg/HTZ 12,5 mg - for 235 pts, losartan 100 mg / HTZ 25 mg - for 100 pts. Serum uric acid level was examined before and after one and three months of treatment. The effectiveness of therapy was evaluated by monitoring of the office blood pressure.

Results: The initial serum uric acid level in patients with normouricemia was 291,7±3,5 mmol /L. In one and three months of therapy losartan has not changed it significantly: 298,4±4,3 mmol/L and 293,6±4,4 mmol/L, respectively ($p>0,05$ in both cases). In hyperuricemic patients a significant decrease of serum uric acid level was stated - from 445,7±8,0 mmol/L to 396,4±8,9 mmol/L ($p<0,001$) after 1 month of therapy and up to 387,4±8,3 mmol/L ($p<0,001$) at the end of the observation. Positive effect of losartan on uric acid levels was observed not only under losartan monotherapy. Combination of losartan with different doses of HTZ did not increase serum uric acid level, on the contrary, in one and three months of therapy slightly decreased it ($p>0,05$). Losartan and its combination with different doses of HTZ significantly decreased blood pressure in one and three months of treatment ($p<0,001$ in all cases).

Conclusions: Losartan has the selective effect on serum uric acid depending on the initial value of it: the drug did not reduce the normal level of uric acid, but if it was elevated losartan produced a pronounced hypouricemic effect. Our data suggest that losartan may prevent the HTZ induced hyperuricemia.

POSTERS' SESSION

POSTERS' SESSION PS41
SPORT EXERCISE AND BLOOD PRESSURE

PP.41.01 ENDURANCE EVALUATING THE CONCEPT OF CRITICAL POWER-MEASUREMENT TO PREDICT TRAINING SUCCESS IN PATIENTS WITH ARTERIAL HYPERTENSION

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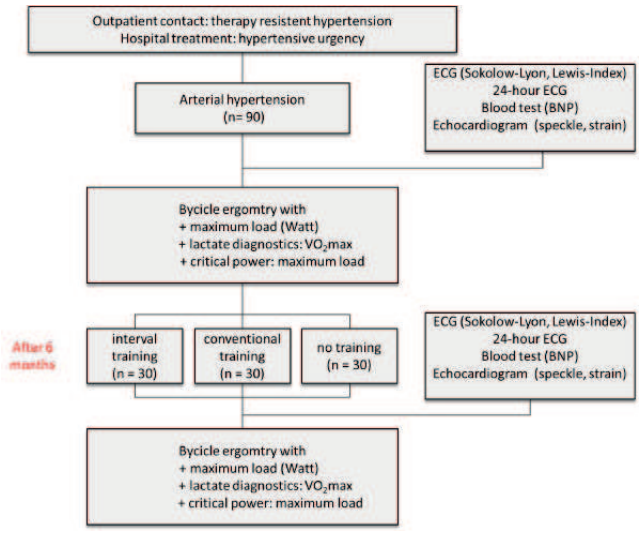
Objective: Epidemiological studies suggest a positive effect of regular physical activity on preventing and treating arterial hypertension. Reduced physical activity elevates cardiovascular risk and mortality.
The concept of critical power used in physical performance diagnostics may perform as a predictive parameter for training success in patients with arterial hypertension.
The critical power concept developed by Monod & Scherrer (1965) describes the maximum power depending on the load duration. Hence the performance of a test person can be predicted for a certain load over a certain time by identifying the individual anaerobic threshold through monitoring lactate concentrations during exercise and then applying a certain mathematical algorithm. This concept has been previously evaluated for athletes. Our approach aims at using this concept for predicting training success for patients with hypertension.



PP.41.02 BLOOD PRESSURE RESPONSE TO EXERCISE TESTING IN CHILDREN

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Objective: Observational epidemiologic studies and numerous clinical trials reveal that physical activity is associated with reduced blood pressure, and is therefore a a key component for the prevention and treatment of hypertension in children and adolescents. The purpose of this study was to assess blood pressure changes in children and adolescents who were involved in competitive sports and those who were not physically active, before, during and after excersie testing.

Design and method: The subjects included in the study consisted of 17 sportspersons and 10 non-athletic students with aged 10-17 years. Blood pressure (BP) at the right arm was measured in sitting position at 5 minutes before, 6 minutes after starting physical activity and 5 minutes after the end of the exercise. Weight, height, body mass index (BMI), mean arterial pressure (MAP) and pulse pressure (PP) were measured by ordinary methods. Data was analyzed using student's t- test. Results were expressed as mean ± SD. The statistical difference was considered significant at $P < 0.05$.

Results: The results showed that while systolic BP (SBP) increased during and 5 minutes after the end of physical exercise in both groups, diastolic BP (DBP) decreased. However, SBP values were significantly lower in the non-athletic group compared to the athletes. On the other hand, DBP values were significantly lower in athletic group compared to non-athletes. Moreover, heart rate values were significantly lower at rest, during and 5 minutes after the end of physical exercise in athletic group compared to non-athletes.

Conclusions: Our results revealed that physical activity reduced arterial BP levels in children involved in competitive sports.

PP.41.03 ADMA LEVELS PREDICT EXAGGERATED BLOOD PRESSURE RESPONSE TO EXERCISE

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Objective: Asymmetric dimethylarginine (ADMA), an endogenous inhibitor of nitric oxide production, has been demonstrated to have a dual role in cardiovascular disease serving as both a mediator and a biomarker. The purpose of this study was to assess the correlation between ADMA and treadmill stress test blood pressure response in patients with intermediate risk for coronary artery disease (CAD).

Design and method: Study participants were individuals without a history of atherosclerotic disease, referred to our hospital with symptoms of suspected CAD and evaluated with a treadmill exercise stress test (EST). ADMA levels were measured before EST. Exaggerated blood pressure response (EBPR) was defined as systolic BP >= 200 mmHg or the diastolic BP >=100 mmHg at peak exercise.

Results: Study population consisted of 209 individuals (165 males, 58.1 ±10.9 years old). Significant correlations were detected between ADMA levels and EBPR ($r=0.166$, $p=0.016$), maximal exercise time ($r=-0.556$, $p<0.001$), METs achieved ($r=-0.555$, $p<0.001$) and DTS ($r=-0.347$, $p<0.001$). In the subgroup analysis, subjects with exaggerated BP response (EBPR) (n=20) had statistically significant lower ADMA levels (0.67 ± 0.17 vs 0.77 ± 0.17 μmol/l, $p=0.016$) in contrast to those with normal BP response (n=189) at the ESCT. Multivariate analysis revealed that ADMA remained an independent predictor of EBPR ($R2=0.272$; beta=0.280; 95% confidence interval 0.035 to 0.525; $p=0.025$) after adjustment for age, BMI, gender, diabetes, smoking status and family history of premature CAD.

Conclusions: ADMA levels are correlated to EBPR and are an independent predictor of EBPR. This implies that ADMA itself may play a key role in the pathophysiology of EBPR to exercise.

PP.41.04 THE PROGNOSTIC VALUE OF OXYGEN KINETICS DURING EARLY RECOVERY AFTER EXERCISE IN HYPERTENSIVE PATIENTS WITH IMPAIRED CORONARY FLOW RESERVE

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Objective: Eighty (80) non-diabetic, recently diagnosed and well-controlled hypertensive patients (mean age 51+11 years, 55 men) underwent a ramp symptom-limited cardiopulmonary exercise test (CPET) on a bicycle ergometry. We evaluated exercise parameters (work load, O2 pulse and VE/VCO2 slope) as well as oxygen kinetics during exercise (peak oxygen consumption [peak VO2]) and early recovery period (slope of VO2 decline during the first minute of recovery, VO2rec). Coronary flow reserve, which was estimated before CPET, was measured by means of color-guided Doppler

echocardiography at the distal tract of the left ascending coronary artery after adenosine infusion (140 mg/kg/min). The study group was divided according to CFR values to group A (n=57, normal CFR>2) and group B (n=23, impaired CFR<2.0).

Design and method: The period of early recovery after exercise is characterized by a rapid payback of the oxygen debt incurred during exercise which in turn reflects normal circulatory function. Hypertension may be accompanied by impaired coronary microcirculation. We hypothesized that oxygen consumption (VO2) during exercise as well as its decline during the first minute of recovery after exercise will be impaired in hypertensive patients with reduced coronary flow reserve.

Results: No significant differences were found between groups regarding age, body mass index and systolic and diastolic blood pressure at rest. All patients completed successfully the exercise test without ECG signs or symptoms of myocardial ischemia. Regarding total population, VO2rec was strongly related with peak VO2 (r= 0.72, p<0.001), work load (r= 0.70, p<0.001), O2 pulse (r= 0.70, p<0.001) and VE/VCO2 slope (r= -0.20, p<0.05). We found that patients in group B had lower work load (146+46 vs. 122+38 watts, p<0.05), peak VO2 (2053+570 vs. 1798+455 ml/min, p<0.05) while VO2rec was significantly slower (816+374 vs. 634+258, p<0.01).

Conclusions: Hypertensive patients with impaired coronary microcirculation achieve reduced peak exercise parameters (work load, oxygen consumption, and oxygen recovery). Cardiopulmonary exercise test may be a useful tool in cardiovascular risk estimation in hypertensive population.

PP.41.05 IMPACT OF SHORT-TERM EXERCISE TRAINING AND RESIDUAL ISCHEMIA ON ARTERIAL BLOOD PRESSURE, DOUBLE PRODUCT AND QT DISPERSION IN PATIENTS AFTER CORONARY ARTERY BYPASS GRAFTING

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Objective: The aim of this study was to establish the influence of short-term exercise training and residual ischemia (RI) on arterial blood pressure (BP), double product (DP) and QT dispersion, in patients after coronary artery bypass grafting (CABG).

Design and method: The study involved 172 patients after CABG (mean age 57.3 years). Patients were randomly divided into the physical training group (TG: 133 patients) and non-training group (NTG: 39 patients). In all subjects exercise test, were performed and after that TG patients were included in program of physical training for three weeks, using the bicycle ergometer (10 min, 2 times a day) and walking.

Results: RI was present in 29 (21.8%) patients in the TG and in 9 (23.1%) patients in the NTG. In the TG, before starting with the program of physical training, patients with RI had significantly higher values of QTdc (p<0.005), while the values of systolic and diastolic BP and DP did not significantly vary in comparison to those without RI. After three weeks, in the TG patients with RI, we have found significant reduction of systolic BP from 138.9 ± 11.8 to 132.8 ± 10.6 mmHg (p<0.05), of diastolic BP from 89.0 ± 6.8 to 84.8 ± 7.9 mmHg (p<0.05), of DP from 11752.6 ± 653.8 to 11390.5 ± 492.7 beat/min x mmHg (p<0.02) and of QTdc from 55.6 ± 13.4 to 48.8 ± 12.5ms (p<0.05). In the TG patients without RI, after three weeks, we have found significant reduction of systolic BP from 137.9 ± 13.6 to 130.1 ± 8.9 mmHg (p<0.001), of diastolic BP from 88.2 ± 9.0 to 82.9 ± 6.3 mmHg (p<0.001), of DP from 11505.3 ± 724.4 to 10124.5 ± 529.6 beat/min x mmHg (p<0.001) and of QTdc from 47.2 ± 16.8 to 39.6 ± 15.9ms (p<0.001). In contrast, the NTG showed no significant changes.

Conclusions: The study showed that short-term exercise training has favourable effects on arterial BP, DP and QTdc in patients after CABG, especially in those without RI. Physical training led to the significant decrease of myocardial oxygen uptake at rest and myocardial vulnerability.

PP.41.06 AMBULATORY HYPOTENSIVE EFFECT OF PHYSICAL TRAINING: A REAPPRAISAL THROUGH A META-ANALYSIS OF SELECTED MODERATORS

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Objective: The effectiveness of chronic exercise to decrease both systolic and diastolic blood pressure (SBP and DBP) is well established. However, this hypotensive effect may be altered by a number of variables including the participants' characteristics, the physical activity program characteristics and other co-interventions including diet or medication. Therefore, the purpose of this study was to assess the effect of these moderators on ambulatory blood pressure (BP) through a meta-analysis of the existing literature.

Design and method: Three databases were searched using relevant terms and strategies (from 1945 to 2013-Oct-19). Twenty-eight studies from 676 identified records met following inclusion criteria: randomized controlled trials with quality score using PEDro scale or van Tulder scale >=5, presence of relevant details about training intervention and subjects' characteristics, and pre and post-training measurements of ambulatory blood pressure (ABPM).

Results: The overall effect -of physical activity programs- was a weighted mean difference reached for day-time systolic / diastolic ABPM -3.82/-3.29 mmHg (95% CI -5.15 to -2.49 and -4.59 to -1.99 respectively; P<0.01). Moderators associated with ABPM improvement were the following: an initial casual BP >=140/90 mmHg (hypertensive or uncontrolled BP subjects), diet co-intervention, training program duration >12 weeks, and cumulative number of exercises >40 sessions. These improvements were significant or higher for day-time SBP than other BP variables. We found no differences for gender, age, or presence of antihypertensive drugs.

Conclusions: Antihypertensive effects of aerobic training assessed by ABPM appear modest but significant, and our meta-analysis highlights favorable moderators as initial high BP, diet, and training cumulative duration.

PP.41.07 EXAGGERATED BLOOD PRESSURE RESPONSES TO EXERCISE STRESS TESTING AT MODERATE INTENSITY: A WARNING SIGNAL TO DOCTORS ON THE PRESENCE OF HYPERTENSION

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Objective: Patients with exaggerated blood pressure (BP) responses during exercise stress testing at moderate intensity have increased cardiovascular mortality. It has been hypothesized that exaggerated BP responses may be indicative of the presence of hypertension (thus explaining increased mortality risk), but this has never been examined in unselected patients and was the aim of this study.

Design and method: Participants were 100 consecutive patients (age 56±9 years, 30% female) undergoing a clinically indicated exercise stress test who were free from coronary artery disease. Exercise BP was recorded at each stage of the Bruce protocol and BP control was determined by 24-hour ambulatory BP monitoring. Resting BP was recorded at seated rest in duplicate. Hypertension was defined as 24-hour systolic BP >=130 mmHg or daytime systolic BP >=135 mmHg.

Results: Independent of age, sex, and resting systolic BP, patients with exercise systolic BP >=150 mmHg at stage 1 or stage 2 of the exercise stress test had significantly higher 24-hour systolic BP (140±10 vs 120±7 mmHg; p<0.001), daytime systolic BP (147±10 vs 125±7 mmHg; p<0.001) and prevalence of hypertension (74% vs 37%; p<0.001) compared to those with exercise systolic BP <150 mmHg. Furthermore, exercise systolic BP at stage 1 of the exercise stress test independently predicted the presence of hypertension on logistic regression analysis with same model variables as above (Wald statistic 5.0; 78% sensitivity; 73% accuracy; p=0.026).

Conclusions: Irrespective of resting BP, a systolic BP >=150 mmHg at stages 1 or 2 of an exercise stress test is strongly associated with the presence of hypertension. Thus, exaggerated exercise BP should be a warning signal to doctors to provide appropriate follow up of these patients and reduce cardiovascular risk related to BP.

PP.41.08 BREATHING TRAINING MODULATES THE BLOOD PRESSURE RESPONSES TO EXERCISE IN STABLE HYPERTENSIVE PATIENTS

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Objective: To determine the effect of slow breathing training on the cardiovascular responses to exercise of an untrained muscle.

Design and method: Twenty controlled hypertensive subjects trained for 8 weeks, 10 with unloaded slow breathing (Sham) and 10 breathing against an inspiratory load of 20 cm H2O (Load). Ten subjects were untrained Controls. Subjects performed a 2 minute handgrip test (30% max) before and after training, measuring blood pressure and heart rate (HR) before the contraction, at the end and following 2 minutes recovery. Heart rate variability (HRV) was measured at rest before and after training.

Results: Resting systolic (sBP) and HR were reduced as a result of training, as reported previously. After training there was both a smaller blood pressure response to handgrip exercise and a more rapid recovery of sBP and HR compared to before training. There were no changes in the Controls and no differences between the Sham and Load groups, indicating that slow breathing rather than respiratory work was the important factor. Combining the two training groups, the sBP response to handgrip exercise after training was reduced by 10 mmHg (95% CI: 7, 13) and HR by 5 bpm (95% CI: 4, 6), all $p<0.05$. HRV showed a shift to higher spectral frequencies following training (LF/HF 1.07± 0.54 before and 0.81± 0.35 after training: $p = 0.019$).

Conclusions: Slow breathing training reduces the blood pressure and heart rate responses to contraction of muscles that have not been trained. This indicates that slow breathing training can modify central mechanisms regulating cardiovascular function.

PP.41.09 EFFECTS OF EXERCISE TRAINING ON HYPERTENSION AND RENAL FUNCTION IN DAHL SALT-SENSITIVE RATS

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Objective: Exercise training (Ex) has antihypertensive and renoprotective effects in humans and rats with hypertension and chronic kidney disease. Since little has been reported on effects of Ex on salt-sensitive hypertension and concomitant renal disorder, we investigated effects of Ex on blood pressure and renal function in Dahl salt-sensitive (Dahl-S) rats.

Design and method: Six-week-old male Dahl-S rats were divided into four groups: 1) normal salt (0.6% NaCl) diet (NS) (NS-Sed group, n=10), 2) NS plus Ex (NS-Ex group, n=10), 3) high salt (8% NaCl) diet (HS) (HS group, n=11), 3) HS plus Ex (HS-Ex group, n=11). Ex groups underwent treadmill running for eight weeks.

Results: HS induced severe hypertension, and Ex did not significantly change systolic blood pressure (114±3, 111±3, 209±6 and 205±8 mmHg in the NS-Sed, NS-Ex, HS-Sed and HS-Ex groups, respectively). HS significantly increased plasma creatinine, and Ex did not affect plasma creatinine (0.22±0.01, 0.21±0.01, 0.44±0.03 and 0.40±0.03 mg/dl). HS decreased creatinine clearance, but Ex significantly increased creatinine clearance (2.57±0.07, 2.25±0.12, 0.96±0.04 and 1.35±0.18 mg/dl). HS induced massive proteinuria, but Ex significantly decreased urinary protein excretion (15.9±1.6, 14.8±1.9, 432.8±36.8 and 327.2±22.3 mg/day). Also, Ex improved HS-induced kidney weight gain and glomerulosclerosis. HS markedly increased urinary TBARS, an index of oxidative stress, but Ex significantly decreased urinary TBARS (0.30±0.02, 0.30±0.02, 0.75±0.06 and 0.53±0.03 µmol/day); there was no significant difference in plasma TBARS among all groups. Ex significantly decreased HS-stimulated xanthine oxidoreductase activity, but not NADPH oxidase activity in the kidney. HS significantly decreased NOS activity in all kidney sections, whereas it increased the eNOS protein expression in the renal cortex and outer medulla. Ex did not affect the HS-decreased NOS activity in the kidney, although attenuated the HS-increased eNOS protein expression.

Conclusions: This study demonstrated that Ex improves HS-induced renal dysfunction, proteinuria and glomerulosclerosis independently of blood pressure in Dahl -S rats. The renoprotective effects of Ex were concomitant with improvement of oxidative stress and NO system disorders in the kidneys. Ex may be an effective therapeutic approach for preventing the development of renal disorders in salt-sensitive hypertension.

PP.41.10 EXERCISE-INDUCED CARDIOPROTECTION AGAINST ISCHEMIA-REPERFUSION INJURY IS ABOLISHED AFTER DELTA OPIOID RECEPTOR BLOCKADE

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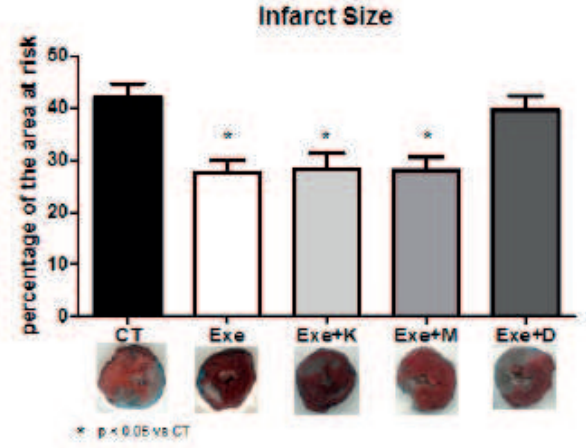
Objective: Investigate the mechanisms involved in exercise-induced cardioprotection.

Design and method: Male Wistar rats were first divided into 2 groups: exercised (Exe) and control (CT). The exercised group underwent 4 consecutive days of treadmill training (60 min at 70% of maximal oxygen consumption). To induce I-R injury, anesthetized animals were submitted to a left thoracotomy and a 30 min interventricular coronary occlusion followed by 60 min of reperfusion. The hemodynamic parameters were recorded and infarct size was determined post-mortem by double staining using TTC/Evans blue. Structural capillary density, gene expression of antioxidant enzyme capacity and opioid receptors subtypes expression were measured in left ventricle of Exe (n = 5) and CT (n = 5) groups using histochemical analysis, RT-PCR and western blotting; respectively. Exe group was then divided into 3 more subgroups: exercised + kappa opioid receptor antagonist (Exe + K; n=4); exercised + delta opioid receptor antagonist (Exe + D; n=4); and exercised + mu opioid receptor antagonist (Exe + M; n=4). All 3 groups were submitted to the same I-R injury, exercise and infarct size measurement protocol already described.

Results: The left ventricle structural capillary density was similar in both groups (Exe: 0.22 ± 0.01 vs CT: 0.21 ± 0.01 Vv[cap]/Vv[fib]). Measurement of mRNA expression of antioxidant enzymes in Exe and CT groups revealed no differences: endothelial cell superoxide dismutase (SOD) (1.1 ± 0.9 fold control), cupper zinc SOD (0.9 ± 0.2 fold control), manganese SOD (0.9 ± 0.2 fold control) and Catalase (1.1 ± 0.4 fold control). Exe group presented a significant reduced protein expression of KOR compared to CT group (0.46 ± 0.07 vs. 0.82 ± 0.08 a.u.; $p < 0.05$), whereas DOR was not different between groups (Exe: 0.38 ± 0.06 vs. CT: 0.61 ± 0.11 au). Finally, as shown in the figure, Exe group showed a significant reduction in the infarcted area (27.6%) when compared to CT group (42.0%). Exe+K and Exe+M did not alter the cardioprotective effect of exercise, whereas Exe+D abolished the exercise-induced cardioprotection.



Conclusions: Endogenous delta opioid system is involved in cardioprotection conferred by acute exercise.

PP.41.11 EFFECTS OF HIGH ALTITUDE EXPOSURE AND OF TREATMENT WITH TELMISARTAN AND NIFEDIPINE GITS COMBINATION ON BLOOD PRESSURE RESPONSE TO SIX MINUTE WALKING TEST IN HYPERTENSIVE SUBJECTS

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Objective: Acute exposure to high-altitude (HA) hypobaric hypoxia decreases exercise performance in healthy subjects, and increases systolic (S) and diastolic (D) blood pressure (BP). Little is known on BP responses to exercise in hypertensive subjects exposed to HA, and on effects of antihypertensive treatment in this setting.

Design and method: We aimed at evaluating the effects of telmisartan 80mg–nifedipine slow release 30mg (T/N) combination treatment in hypertensive subjects exposed acutely to HA who underwent 6-minute walk test (6MWT). Eighty-two mild-hypertensive participants of HIGHCARE-ANDES study (age 51.9±9.7; 47M/35F; BMI 28.2±3.5kg/m2) performed a 6-minute walk test(6MWT) in 3 conditions: at sea-level (SL) off-treatment (SLbas) and after 6 weeks of double-blind treatment with T/N (n=43) or placebo (PL, n=39) (SLtx); after the 1st full day of permanence at 3260m altitude (Huancayo-Perù; HA) under randomized treatment.

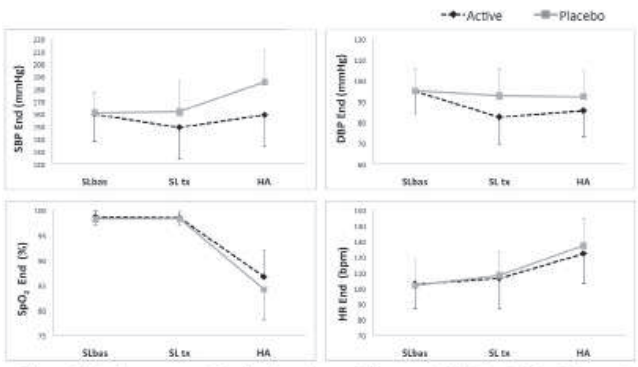

Figure. Clinical parameters after the six minute walking test (6MWT) at SLbas, SLtx and HA.SpO_2, Blood oxygen saturation; HR, Heart Rate; SBP, Systolic Blood Pressure; DBP, Diastolic Blood Pressure; HA, high altitude; SL, sea level. Data are shown as mean±SD. + p <0,001 vs SL; ## p < 0, 001 vs PL; # p < 0, 01vs PL; ∫ p ≤ 0,05 vs PL.

Results: Exercise performance and vital signs after the exercise were similar in both groups at SLbas. SBP/DBP (Figure) at the end of the exercise was significantly lower in T/N than PL at SLtx (149.3±25.3/82.5±10.1 vs 162.1±24.6/92.9±13.1; p<0.001). At HA, SBP significantly increased in both groups after exercise, remaining significantly lower in T/N (159.1±24.6 vs. 185.7±25.6 mmHg, p<0.001). DBP did not differ between SLtx and HA in both groups, remaining lower in T/N (85.4±13.0 vs. 92.4±12.2, p<0.01). Mean end-exercise SpO2 decreased at HA in both groups, however, it was significantly higher in T/N compared to PL (86.6±5.2 vs 84.2±6.0; p<=0.05), whereas HR increased at HA, and did not show significant differences between groups. The 6-minute walking distance decreased significantly at HA, without differences between treatment groups, from 597±57 to 536.8±58.4m in T/N and from 599±61 to 537±56m in PL (both p<0.001).

Conclusions: Acute HA exposure is responsible for an increased SBP response at the end of exercise in hypertensive subjects as compared to sea level. At HA, T/N therapy effectively reduced SBP and improved oxygen saturation at the end of the exercise, without affecting the six minute walking test performance. These results are relevant for hypertensive subjects planning physical activity either for leisure or work at HA.

PP.41.12 EFFECTS OF ISOMETRIC AND AEROBIC EXERCISE ON PERIPHERAL AND CENTRAL BLOOD PRESSURE IN HYPERTENSIVE SUBJECTS

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Objective: Aerobic endurance and dynamic resistance exercise training are recommended by current hypertension guidelines as part of the non-pharmacologic treatment of hypertension. Isometric training, due to the lack of data from controlled trials is not been yet recommended for patients with hypertension, despite several trials suggesting a blood pressure lowering effect. We assess for the first time the effects of isometric handgrip training in a randomised controlled trial.

Design and method: 68 hypertensive patients were prospectively randomized in three groups to undergo following training modalities for 12 weeks: A. handgrip isometric training 5 times weekly consisting of 2 contractions of 2 min at 30% of maximal power with each arm corresponding to an overall duration of 12 min per training session; B. placebo-handgrip training 5 times weekly consisting of 2 contractions of 2 min at 5% of maximal power with each arm corresponding to an overall duration of 12 min per training session and C. aerobic exercise training of 30 minutes at least 3 times per week (no structured exercise regimen). All patients underwent office blood pressure measurement, 24h ambulatory BP measurement and non-invasive assessment of the arterial compliance by carotis-femoral pulse wave velocity at baseline and after 12 weeks.

Results: Baseline characteristics did not differ between groups (table 1). Patients in the aerobic exercise group showed a significant reduction of the office systolic BP from 141.0±19.9mmHg to 130.4±26.0 mmHg (p=0.018). In the 24h ABPM a significant reduction of the systolic and diastolic BP was seen (p=0.02 each). Patients undergoing aerobic exercise demonstrated an improvement of the augmentation index and the central blood pressure. Patients in the isometric groups did not show any changes in any of the endpoints of the study (table 2).

Table 1: Characteristics of the patients at baseline. Chi-Quadrat-Test und ANOVA test were performed.

	Totally (n=68)	Handgrip (n=23)	Placebo-Handgrip (n=23)	Aerobic Exercise (n=22)	p
Males	29	9	10	10	0.69
Females	39	14	13	12	
Mean age in years	51.4±9.4 (41-70)	50.4±10.1	51.8±7.3	52.3±10.7	0.42
Mean BMI in kg/m²	26.9±5.1	26.0±3.4	27.9±6.9	27.2±4.3	0.65
Atrial fibrillation, n	7	2	3	2	0.85
Coronary artery disease, n	2	0	2	0	0.15
Diabetes Mellitus	4	2	2	0	0.45
Hypertriglyceridemia, n	30	9	12	9	0.52
Antihypertensive medication, n	52	21	16	15	0.51

Table 2: Results of the office blood pressure (BP), 24h-ambulatory blood pressure (ABPM) and carotid-femoral pulse wave velocity. Paired t-tests between baseline and follow-up were performed. P <0.05 was regarded significant.

	Handgrip (n=23)			Placebo-Handgrip (n=23)			Aerobic Exercise (n=22)		
	Baseline	Follow-up	p	Baseline	Follow-up	p	Baseline	Follow-up	p
Office syst. BP (mmHg)	137.5±21.0	137.3±14.5	0.92	137.3±21.7	132.2±15.7	0.22	141.0±19.9	130.4±26.0	**0.018**
Office diast. BP (mmHg)	79.0±11.6	78.1±8.9	0.54	78.7±11.9	77.0±10.5	0.63	74.8±11.4	72.1±16.9	0.35
24h-ABPM syst. (mmHg)	123.5±10.2	125.2±9.7	0.4	128.5±16.8	126.0±11.4	0.25	128.9±10.7	123.2±11.9	**0.02**
24h-ABPM diast. (mmHg)	77.1±8.2	76.9±5.9	0.72	81.0±9.4	79.5±6.9	0.29	79.3±9.1	76.7±11.2	**0.02**
24h-ABPM daytime syst. (mmHg)	129.0±10.9	129.5±9.3	0.44	133.3±10.4	130.0±10.9	0.19	133.5±11.1	126.9±11.5	**0.007**
24h-ABPM daytime diast. (mmHg)	80.8±5.7	80.2±6.1	0.65	85.5±10.4	82.9±7.7	0.13	83.1±9.4	76.6±11.9	**0.005**
24h-ABPM nighttime syst. (mmHg)	115.6±9.5	117.3±11.2	0.39	116.5±18.5	119.1±14.0	0.67	120.5±11.9	115.3±13.8	0.06
24h ABPM nighttime diast. (mmHg)	70.5±6.2	70.5±6.9	0.95	73.4±9.4	73.1±7.4	0.77	72.8±9.5	70.8±10.4	0.19
Carotid to femoral pulse wave velocity (m/s)	9.2±2.2	9.5±2.7	0.56	8.5±1.9	8.7±2.4	0.51	8.8±2.4	8.4±3.1	0.28
Augmentation index (%)	23.7±12.3	21.0±9.7	0.15	22.8±10.7	20.1±8.9	0.12	22.9±10.1	16.1±10.3	0.014
Central systolic BP (mmHg)	140.0±22.1	134.8±18.1	0.1	139.8±23.1	132.0±18.8	0.08	145.7±15.6	134.6±19.7	0.012

Conclusions: Isometric handgrip training, performed according to a typical protocol, does not reduce blood pressure in hypertensive patients. Aerobic exercise, even as an uncontrolled and unsupervised exercise regimen, led to a significant reduction of the peripheral and central blood pressure.

PP.41.13 MEAN ARTERIAL PRESSURE DURING SUBMAXIMAL EXERCISE IS ASSOCIATED WITH MAKERS OF SUBCLINICAL ATHEROSCLEROSIS IN PREHYPERTENSION

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Objective: Recent studies have suggested that pathophysiological alterations of vascular wall may contribute to an excessive increase in BP during dynamic exercise. The aim of this study was to examine the possible association between mean arterial pressure (MAP) during submaximal exercise and the markers of subclinical atherosclerosis in prehypertensive subjects.

Design and method: The study population consisted of 109 untreated men (mean age, 44 years) with prehypertension (SBP, 120-139mmHg; DBP, 80-89mmHg). A graded exercise test was performed on a bicycle ergometer and MAP ({SBP-DBP}/3+DBP) during a submaximal workload of 100 watts was evaluated. Arterial stiffness was assessed by an augmentation index (AIx) on the basis of radial pressure waveform analysis. Albumin-to-creatinine ratio values were determined as the mean of two nonconsecutive spot urine specimens. A fasting blood sample was collected for the measurement of lipid and glucose profiles by standard techniques.

Results: The mean±SD of MAP during the submaximal exercise was 123±15 mmHg. The MAP values were expressed as z-score normalized for the relative increase in HR from baseline to exercise. The MAP z-score was significantly higher in the subjects with elevated BP, dyslipidemia, or hyperglycemia than in those without such metabolic risk variables. The subjects with higher exercise MAP z-score (>=+1.0, n=38), compared with those with the lower MAP values (<+1.0, n=71), exhibited significantly higher AIx (77.1±13.1 vs. 63.2±15.8 %, p<0.01) and greater log

albumin-to-creatinine ratio (0.82±0.32 vs. 0.52±0.29 mg/gCre, p<0.01), independent of potentially confounding factors. Multivariate regression analysis revealed that resting elevated SBP (β=0.277) and DBP (β=0.306) and greater albumin-to-creatinine ratio (β=0.247) were independent determinants of increased MAP z-score during submaximal exercise (R^2=0.401, F=25.6; p<0.001).

Conclusions: These results suggest that a subclinical atherosclerosis may have a greater influence on vascular reactivity than on basal tone and hence could potentially be identified by an exaggerated response of BP to dynamic exercise even before clinical manifestation of hypertension.

PP.41.14 THE CARDIOVASCULAR PARAMETERS VARIATION DURING SUBMAXIMAL EFFORT PERFORMED BY SUPRAPONDERAL STUDENTS

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Objective: To investigate cardiovascular adaptation to submaximal effort performed by untrained supraponderal students.

Design and method: There were enrolled in the study 10 male students (20 years old), with body weight 78.8 ± 14.14 Kg, 176 ± 6.84 cm high, untrained, nonsmokers. The BMI was 25 to 29.9. The students performed a progressive submaximal effort on the cycloergometer until reaching the optimal heart rate (OHR = 175 b/min). The charge increased every two minutes with 25 W. There were determined the blood pressure (BP), heart rate (HR) before, during the exercise and at the end of the effort.

Results: Resting heart rate (HR) was 85.6 ± 13.69 b/min slightly increased caused by the sympathetic activation, reached HR of 161.33 ± 9.79 b/min in the 12 min of the effort. After 2 minutes at the end of the effort HR was still high (127 ± 6.22 b/min).
During the effort, systolic blood pressure gradually increased with 2.8 mmHg/min (158±11.66 mmHg vs. 124 ± 7.34 mmHg). The diastolic blood pressure at rest was 72 ± 8.12 mmHg and slightly decreased at the end of effort (70 ± 8.36 mmHg). This can be explained by the decrease of the total peripheral resistance due to vasodilatation. 2 minutes after the effort ended, systolic blood pressure decreased to 138 ± 7.48 mmHg, and diastolic blood pressure was 66 ± 5.83 mmHg. There was a positive correlation between body weight, heart rate (r = 0.68), and blood pressure (r = 0.73), during the submaximal effort.
The effort test was stopped in some cases after 10 minutes when the HR was 159±14.83 b/min because the students presented dispnea. The students were advised to reduce their body weight in order to decrease the cardiovascular risk associated with to being overweight.

Conclusions: Cardiovascular response to effort was in normal limits. The effort test demonstrated that the students can perform an effort test even if they are overweight and OHR wasn't reached in all cases.

PP.41.15 RESPONSE OF CENTRAL BLOOD PRESSURE TO ISOMETRIC AND ISOTONIC EXERCISES IN MILD HYPERTENSIVE PATIENTS

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Objective: Blood pressure measured over the brachial artery (peripheral blood pressure) is routinely used for individual risk evaluation and management of hypertension, because it has been established as a powerful predictor of cardiovascular morbidity and mortality. However, blood pressure changes every moment and peripheral blood pressure measured during exercise has been recognized as a marker of cardiovascular risk independent of resting peripheral blood pressure. Recent studies suggest that central blood pressure is more closely associated with target organ damage and cardiovascular events than peripheral blood pressure. The aim of the present study was to investigate central blood pressure responses to exercise.

Design and method: Subjects with mild hypertension who attained target blood pressure (140/90 mmHg) following lifestyle modification without any antihypertensive medication were enrolled in the study (38 ± 6 years, n = 18) and changes in central and brachial blood pressure were recorded in response to ergometer and hand-grip exercises. Central blood pressure was estimated using an automated device (Omron HEM-9000AI).

Results: Systolic brachial blood pressure was increased after both ergometer (from 119 ± 10 to 172 ± 16 mmHg; p < 0.001) and hand-grip (from 118 ± 8 to 122 ± 9 mmHg; p < 0.05) exercises, but central systolic blood pressure was increased only after hand-grip exercise (from 117 ± 11 to 121 ± 12 mmHg; p < 0.05). The radial augmentation index was increased after hand-grip exercise, whereas ergometer exercise reduced this index. Heart rate was increased only after ergometer exercise.

Conclusions: Isometric, but not isotonic, exercise increases central blood pressure in subjects with mild hypertension. The response of central blood pressure, which is a better index of cardiac load than peripheral blood pressure, to hand-grip exercise may be useful in evaluating cardiovascular risk.

PP.41.16 ALTERED LEUKOCYTE MICRORNA-21 AND -210 ABUNDANCE AFTER 4 WEEKS OF HIGH-INTENSITY EXERCISE TRAINING

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Objective: Small RNA molecules called microRNAs (miRNAs) circulate in human blood and control protein level by post-transcriptional regulation, and as a result govern most cellular functions. Aberrant miRNA expression has been associated with age-related cardiopulmonary/metabolic diseases. Many miRNAs are aberrantly expressed in blood and serve as biomarkers of disease. In particular, miR-21 and miR-210 are related to cardiovascular disease and cancer. Interestingly, the expression of miR-21 and miR-210 has been correlated with cardiorespiratory fitness (VO2max) in healthy individuals, but whether these miRNAs are modulated by long-term exercise training is still unknown. The aim of our study was to determine whether miR-21 and miR-210 are altered by long-term high-intensity interval training (HIT).

Design and method: 19 young (18-24yrs) men completed a physical assessment, treadmill VO2max test and a 5km time-trial before and after 4 weeks of three times a week sprint interval training (HIT). Leukocyte RNA was extracted from blood collected at rest and after a VO2max test before and after HIT. miR-21 and miR-210 expression were quantified by TaqMan quantitative polymerase chain reaction (qPCR) assays.

Results: HIT increased VO2max (ml.kg.min-1, 4.7%, P < 0.05) and maximal treadmill speed (Vmax, 4%, P < 0.01), and decreased low-density lipo-protein (LDL) cholesterol (-3.9%, P < 0.05) and 5km time-trial (-6.2%, P < 0.001). Basal miR-21 expression was higher after 4 weeks of HIT (0.89 ± 1.0 to 1.68 ± 0.92, P < 0.05), and miR-210 expression was lower (0.87 ± 0.48 to 0.51 ± 0.24, P < 0.01). Additionally, miR-210 expression was lower after acute maximal exercise (VO2max test), before (0.87 ± 0.48 to 0.52 ± 0.21, P < 0.01) and after (0.51 ± 0.24 to 0.34 ± 0.1, P < 0.01) HIT.

Conclusions: MiR-210 is lower after acute maximal exercise and both miR-21 and -210 are modulated by HIT. These exercise-responsive miRNAs may contribute to the beneficial cardiorespiratory and cardiovascular health and performance adaptations caused by HIT by regulating key genes.

PP.41.17 IMPAIRED NITRIC OXIDE METABOLISM IS ASSOCIATED WITH HYPERTENSIVE RESPONSE TO EXERCISE

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Objective: To evaluate if there is an association between increase in systolic blood pressure (SBP) during exercise test and baseline values of circulating blood markers of endothelial function: the stable end product of nitric oxide (NOx), asymmetric dimethylarginine (ADMA) and symmetric dimethylarginine (SDMA)(endogenous compounds which impair NO synthesis), and xanthine oxidase (XO, an oxidant-producing enzyme), in hypertensive patients with coronary artery disease (pts).

Design and method: 40 hypertensive male pts were enrolled in the study>3 months after myocardial infarction. In all pts submaximal or symptom limited bicycle exercise test was performed. Patients were classified according to the percent increase in SBP before and after exercise test: increase in SBP less than 15,4% (Group I, N=20 pts, mean age 55 years), and increase in SBP greater than 15,5% (Group II, N=20 pts, mean age 54 years) on the same level of test. Venous blood samples were taken before exercise test and values of NOx, ADMA, SDMA and XO were determined.

Results: Level of exercise achieved was 5.2 MET in both groups. Concentration of NOx was higher in Group I than in group II (37.6±8.4 vs 33.7±7.3 µmol/l, ns), while concentrations of ADMA and of SDMA were significantly lower in Group I than Group II: ADMA 0.257±0.049 µmol/l vs 0.294±0.061 µmol/l; P=0.042; SDMA 0.223±0.035 vs 0.255±0.044 µmol/l; P=0.018. XO activity was also significantly higher in Group II than in Group I (344,5±20.5 vs 303.8±10.9 µmol/l.;

P<0.0005). A positive correlation was also found between increase in SBP per minute and XO (r=0.353; P=0.027) and between difference in baseline SBP and SBP at the and of test and XO (r=0.402;P=0.025) in both groups.

Conclusions: Our results show an association between increase in SBP during exercise test and metabolic markers of endothelial function, for the same level of exercise in hypertensive patients with coronary artery disease. Higher values of ADMA, SDMA, and XO, may induce unfavorable changes in vascular tone, and hence they might contribute to impair endothelial function and SBP regulation during exercise.

PP.41.18 IMPACT OF ACUTE EXERCISE ON MICROVASCULAR REACTIVITY IN HEALTHY SEDENTARY SUBJECTS AND TRAINED ROWERS: POSSIBLE ROLE OF BLOOD PRESSURE INCREASE DURING EXERCISE

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Objective: While it is well recognized that chronic exercise protects against the development of hypertension, acute exhausting exercise (AE) can induce large, transient increases in arterial blood pressure (ABP) and metabolic acidosis, which can be associated with pro-inflammatory response involving oxidant stress known to impair endothelial function.The aim of this study was to test the impact of acute exhausting rowing training on microvascular reactivity in sedentary subjects and trained rowers.

Design and method: Healthy lean sedentary subjects (Sedentary) (N=8) and trained rowers (Trained) (N=8) underwent a single progressive rowing training to maximal exhaustion. Skin microvascular post occlusive reactive hyperemia (PORH) (indicator of endothelial function) was assessed by laser Doppler flowmetry (LDF) before and after AE. ABP, heart rate and oxygen saturation were measured before and after AE and between workloads. Body mass index (BMI) and waist to hip ratio (WHR) were measured in each subject. Plasma glucose, C reactive protein (CRP) and lactate levels, as well as, arterial blood gas analysis and acid base status were measured before and after AE.

Results: All subjects were normotensive age-matched males, with no difference in BMI, WHR, control ABP and heart rate between groups. At baseline, Trained had significantly higher PORH compared to Sedentary (P=0.003). While AE didn't induce any significant change in PORH in Sedentary (P=0.471), PORH was significantly impaired in Trained after AE (P=0.016). Serum lactate and glucose levels significantly increased, and metabolic acidosis occurred, while oxygen saturation decreased after AE in both groups. CRP significantly increased in Sedentary after AE. Systolic blood pressure (SBP) significantly increased during AE in both groups, but more prominent in Trained compared to Sedentary. Increment of SBP during AE tended to adversely correlate with PORH (P=0.068).

Conclusions: These data suggest that a single progressive rowing training to maximal exhaustion impaired microvascular reactivity in trained rowers but not in sedentary subjects, possibly due to 1) higher transient increase in arterial pressure that occurred in trained rowers and/or 2) change in sensitivity to metabolic acidosis during exertion in athletes.

PP.41.19 PHYSICAL PRE-CONDITIONING ATTENUATES DEXAMETHASONE-INDUCED HYPERTENSION INDEPENDENTLY OF RENIN-ANGIOTENSIN SYSTEM

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Objective: To verify the role of renin-angiotensin system (RAS) on dexamethasone-induced hypertension and if this system was involved in the attenuation of blood pressure induced by aerobic exercise.

Design and method: Sixty-seven Wistar rats (±250g) were separated into eight groups: sedentary control (SC), sedentary dexamethasone (SD), trained control (TC), trained dexamethasone (TD), sedentary losartan (SL), sedentary dexamethasone+losartan (SDL), trained+losartan (TL) and trained dexamethasone+losartan (TDL). Animals underwent a training protocol (treadmill, 50-60% of the physical capacity, 1h, 5 days/week for 70 days) or were kept sedentary. During the last 10 days, treated rats received Dexamethasone (Dexa, 1mg/kg per day, i.p) and/or losartan (50mg/Kg per day, oral). All control animals were treated with vehicle. Blood pressure (BP) was assessed after 10 days of treatment. After the experimental protocol, the Left Ventricle (LV) was removed, cleaned, weighed and used for determination of gene expression and protein levels of renin, angiotensinogen (AGT), angiotensin II receptor AT1 and angiotensin II receptor AT2. All data are reported as mean±SEM (p<0.05).

Results: Systolic BP increased 16% (131±4 vs 113±3 mmHg, for SD vs SC, respectively) and mean BP increased 8%. On other hand, training decreased in 7% systolic BP (131±4 vs 122 ± 2 mmHg, for SD vs TD, respectively). Treatment with losartan did not attenuate the increase in BP induced by Dexa (128±5 mmHg). In order to verify the role of RAS, the gene expression and protein levels of its components were assessed by real-Time PCR and Western Blotting analysis, respectively. Dexa Treatment did not determine any alteration of AGT, AT1 or AT2 receptors mRNA. AT1 receptor mRNA was 88.5% higher in TC group compared to SC, but when the animals were treated with Dexa, these values decreased 49.5% (TD vs TC). Dexa only decreased 31% the AGT protein levels and no other changes were observed in any group, even after training.

Conclusions: The results of gene expression and protein levels, associated with BP after losartan treatment, suggest that in this protocol probably the RAS is not the major contributor for the dexamethasone-induced hypertension. Financial support: FAPESP, CNPq and CAPES.

PP.41.20 PHYSICAL FITNESS IMPROVEMENT AFTER CARDIAC REHABILITATION PROGRAM DEPENDS ON PWV

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Objective: Aortic pulse wave velocity (PWV) is a measure of vascular organ damage. After a cardiac event, patients can be offered to follow an educational and exercise program to prevent future events and improve their cardiovascular risk. We hypothesized that the improvement of aerobic performance, measured by maximal oxygen uptake (VO2max), will depend on their initial arterial health measured by PWV.

Design and method: 126 patients (99men, 27women) followed cardiac rehabilitation (CR) programs of Bellan Hospital in Paris. CR duration lasted from 1 to 4 months. 112 patients with both PWV and VO2max measurements before and after CR were analysed. Carotid-femoral PWV and mean arterial pressure (MAP) were measured in a quiet room in the morning of their first and last day prior to any exercise.

Results: After CR, patients improved VO2max (19.6±5.5 to 22.0±6.4 ml/kg/min, +12%, p<0.01) and MAP (92.1±11.8 to 87.9±9.9 mmHg p<0.01), but not PWV (12.0±3.5 to 11.3±3.1 m/s, p=0.1). PWV was negatively correlated with VO2max both before and after CR (p<0.0001 for both). When the cohort was separated into PWV tertiles at entry, patients with the lowest PWV exhibit the highest improvements in VO2max (15.4%, p<0.001), and the lowest improvement of PWV (8.8±0.9 to 9.2±1.9 m/s, p=0.4) and MAP, while patients in the highest tertile improved PWV (15.8±3.1 vs 14.0±3.2 m/s, p=0.001) and MAP, but with lesser improvement of VO2max (5.8%, p=0.005) (see figure).

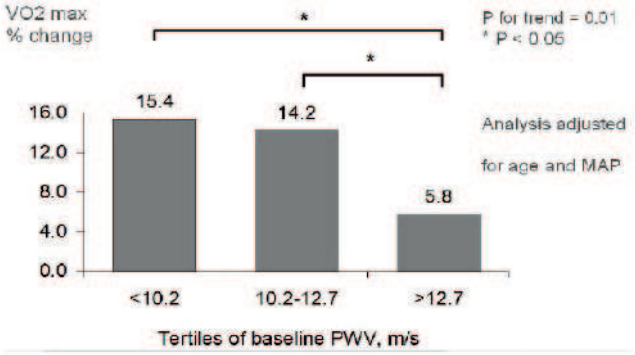

Figure. Percent of changement of maximal oxygen uptake (VO2max) after rehabilitation program by tertiles of baseline aortic pulse wave velocity (PWV). MAP: mean arterial pressure.

Conclusions: In our cohort, physical fitness improvement depends on basal arterial stiffness with highest results for patients with low PWV and poorest results for patients with high PWV.

POSTERS' SESSION

POSTERS' SESSION PS42
DIABETES - KIDNEY - PERIPHERAL ARTERIOPATHY

PP.42.01 HEART RATE VARIABILITY CAN BE ALTERED TO INDICATE CARDIAC MORTALITY AS A FUNCTION OF RENAL DYSFUNCTION FROM AN EARLY- TO END-STAGE OF CHRONIC KIDNEY DISEASE

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Objective: Heart rate variability (HRV) can represent one of the most promising markers for autonomic activity relating to cardiovascular mortality. Decreases in both traditional (i.e., SDNN, RMSSD, VLF, LF/HF), and novel indices [i.e., fractal scaling exponents α1, and deceleration capacity (DC5)], can be provided as the risk for mortality in various clinical settings. Recently, we have reported that an increase in Non-Gaussianity index (λ25) is associated exclusively with increased cardiac mortality risk among post-AMI patients. Meanwhile, autonomic dysfunction can be injured in patients with chronic kidney disease (CKD) even in the early stage. We examined whether heart rate variability can be altered to indicate cardiac mortality as a function of renal dysfunction.

Design and method: Cross sectional study in forty-seven patients with CKD [23 male and 24 female; 49, 36-65, years (median, IQR); eGFR, 63, 39-91, ml/min/1.73m2]. HRVs, including SDNN, RMSSD, VLF, LF/HF, α1, DC5 and λ25, were evaluated by 24-h holter ECG recording.

Results: Median and IQR of the HRVs were SDNN (125, 103-153), RMSSD (26, 18-40), VLF (7.3, 6.6-7.7), LF/HF (2.07, 1.36-2.47), α1 (1.16, 1.04-1.28), DC5 (6.9, 5.0-8.3), and λ25 (0.48, 0.40-0.56), respectively. GFR exhibited positive relationships with SDNN (r=0.16, p=0.3), RMSSD (r=0.01, p=0.9), VLF (r=0.30, p=0.04), LF/HF (r=0.24, p=0.1), α1 (r=0.36, p=0.01) and DC5 (r=0.30, p=0.04), and inversely correlated with λ25 (r=-0.46, p=0.001). When analyzed by stepwise multiple regression analysis (R2 = 0.44), reduced eGFR showed significant relationship with increased λ25 (r=-0.32, F=8.4) and older age, rather than other HRVs.

Conclusions: As renal function deteriorated, SDNN, RMSSD, VLF, LF/HF, α1, DC5 were all decreased, and λ25 increased, indicating an elevated risk of cardiac mortality. Further studies are needed to explore the reason why λ25, out of the HRVs, was most closely related to the renal function, and whether theλ25 can be used as the predictor of the cardiac death in CKD patients.

PP.42.02 SERUM CYSTATIN C IS A DETERMINANT OF CENTRAL PRESSURE AUGMENTATION MEASURED BY OSCILLOMETRIC METHOD IN RENAL TRANSPLANT RECIPIENTS

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Objective: Cardiovascular diseases are particularly prevalent in renal transplant recipients (RTR). Besides traditional risk factors such as dyslipidemia, diabetes or hypertension, others factors more specific to RTR are thought to be in play and to explain the excess of risk seen in transplantation. Beyond its role in evaluating renal function, ScysC is more and more regarded as a potential cardiovascular risk factor. Interestingly, the ability of ScysC to predict cardiovascular outcome is thought to be explained not only by the ability of ScysC to detect renal function impairment but also by its possible connection to others factors that are directly related to cardiovascular diseases.

We aimed to better understand the cardiovascular dimension of ScysC in renal transplantation. We sought to verify whether the association between ScysC and arterial stiffness seen in the general population could extend to RTR and explored the confounding role of major traditional and non-traditional transplant-related cardiovascular risk factors.

Design and method: We explored the potential association of ScysC with arterial stiffness - a major contributor to cardiovascular disease - in RTR. Traditional and non-traditional cardio-vascular risk factors were collected from 215 stable RTR whom arterial stiffness was evaluated by the measure of the augmentation index of central pressure (AIx) determined by the arteriograph device. Serum creatinine and ScysC were measured the same day using standardized methods. Association between ScysC and Aix was examined in univariate and multivariate linear regression analysis.

Results: Two hundred and fifteen RTR were retained for the analysis. ScysC was positively associated with AIx following a monotonic increasing curve. The relation between serum creatinine and AIx followed a J-shaped curve. In univariate analysis, ScysC was strongly associated with AIx. This relationship was not confounded by age, gender, length of time spent on dialysis and transplantation vintage. Adjustment on the level of GFR estimated by the MDRD Study equation attenuated but did not abolish the association between ScysC and AIx.

Conclusions: ScysC is an independent predictor of AIx in RTR. Our data suggest that arterial stiffness may partially mediate the association between ScysC and cardiovascular risk in renal transplantation.

PP.42.03 FEATURES OF THE COURSE OF HYPERTENSION AFTER LAPAROSCOPIC NEPHRECTOMY FOR KIDNEY TUMOR

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Objective: Objective of the study is to analyze the dynamics of blood pressure in the early postoperative period in patients with a tumor of the kidney and hypertension after laparoscopic nephrectomy.

Design and method: Group for laparoscopic nephrectomy selected 53 patients with hypertension aged 37-65 years (average age of 49±7 years). Duration hypertension patients with kidney tumors was 6.5±3.2 years. All patients to assess the effectiveness of the primary purpose or need antihypertensive therapy before the surgery was conducted ambulatory blood pressure monitoring, and with the purpose of correction of antihypertensive therapy after surgery blood pressure monitoring performed on the second and tenth day using the monitor ÌECG-DS-HC-01 («LCA Advanced technologies», Russia).

Results: Strengthening of antihypertensive therapy took all the patients on the second day after the operation, on the tenth day correction of antihypertensive therapy was needed 32 patients (60,4%). Preference given angiotensin inhibitors fosinopril since fosinopril hydrolytic conversion by enzymes in fozinoprilat predominantly occurs in the liver and the mucosa of the gastrointestinal tract. The drug is excreted equally by the liver and kidneys. Dose was selected individually and is 10 to 40 mg per day. After laparoscopic nephrectomy on the second postoperative day were elevated following indicators: daily average systolic blood pressure (167,2±17,8) daily average diastolic blood pressure (96,7±6,2), daily average systolic blood pressure (167,1±18,2), average nighttime systolic blood pressure (154,0±19,7), time index (46,9±14,1%).
After correction of antihypertensive therapy and added to the treatment regimen of nifedipine retard, a decrease of some indicators of ambulatory blood pressure monitoring on the tenth postoperative day, but many of them remained elevated according to the regulations daily average systolic blood pressure (137,2 ±6,8), daily average systolic blood pressure (145,9 ±3,9), average nighttime systolic blood pressure (132,4 ±3,9). Further reception of antihypertensive drugs after surgery allowed to achieve the target values of blood pressure.

Conclusions: Patients with a tumor laparoscopic nephrectomy lead to postoperative increase blood pressure on the second day in 100% of cases, due to the peculiarities of surgical intervention, increased intra-abdominal pressure, hypercapnia. Therapy with calcium antagonists allows to achieve target blood pressure levels.

PP.42.04 HIGH ANKLE BRACHIAL INDEX IS ASSOCIATED WITH VASCULAR CALCIFICATION IN CHRONIC KIDNEY DISEASE

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Objective: The ankle brachial index (ABI) is a noninvasive measure of subclinical CVD and atherosclerosis of the lower extremities. Recently, data suggested that high ABI was associated with cardiovascular mortality and vascular calcification in dialysis patients. However, the association of the spectrum of vascular calcification and high ABI is not well studied in pre-dialysis patients. We investigated the association of vascular calcification with risk of high ABI (>1.4) in 243 patients with chronic kidney disease (CKD).

Design and method: CKD was defined as estimated glomerular filtration rate (eGFR) <60mL/min/1.73m2 or presence of albuminuria. Vascular calcification was assessed using electron-beam computed tomography (EBCT) and coronary artery calcification (CAC) Agatston score was calculated. CAC was classified as none (0), moderate (>0-100) or severe (>100) according to Agatston scores. ABI was obtained per standard protocol and high ABI was defined as >=1.4. Multivariable logistic regression was used to explore the association of CAC and high ABI adjusted for age, gender, race, cigarette smoking, alcohol drinking, body mass index (BMI), LDL-cholesterol, physical activity, mean arterial pressure (MAP), glucose, history of CVD, eGFR, urine albumin/creatinine ratio, treatment for hypertension, diabetes, and hyperlipidemia, and aspirin use.

Results: Compared to those without CAC, the patients with moderate and severe CAC had increased risk of having high ABI. For example, the odds ratio (95% confidence interval) associated with moderate and severe CAC was 7.5 (1.0, 58.3) and 18.3 (2.6, 128.4) for ABI>= 1.4, respectively, after adjustment for age, gender, race, high-school education, physical activity, current cigarette smoking, weekly alcohol drinking, body mass index, LDL-cholesterol, plasma glucose, mean arterial pressure, estimated glomerular filtration rate, and history of cardiovascular disease.

Conclusions: These data indicate that vascular calcification may be associated with risk of high ABI in patients with CKD independent of risk factors for arthrosclerosis.

PP.42.05 ARTERIAL STIFFNESS IS ASSOCIATED WITH VASCULAR CALCIFICATION IN CHRONIC KIDNEY DISEASE

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Objective: Arterial stiffness is very common and associated with increased risk of cardiovascular disease (CVD) in patients with chronic kidney disease. The underlying etiology for increased arterial stiffness is not fully understood. We investigated the association of vascular calcification with risk of arterial stiffness in 235 patients with chronic kidney disease (CKD).

Design and method: Arterial stiffness was measured by aortic pulse wave velocity (PWV) and defined as PWV greater or equal to 10 m/s. Vascular calcification was assessed using electron-beam computed tomography (EBCT) and coronary artery calcification (CAC) Agatston score was calculated.Multivariable linear regression was used to examine the association between PWV and CAC. PWV and CAC were log-transformed.

Results: The prevalence of arterial stiffness was 37% in this study population. In the linear regression model, log-transformed coronary arterial calcification (CAC) was significantly and positively associated with log-transformed pulse wave velocity. For example, one standard deviation higher log-transformed CAC Agatston score (2.8) was associated with a 0.03 m/s (95% confidence interval: 0.02, 0.05, p<0.0001) higher log-transformed pulse wave velocity after adjustment for age, gender, race, high-school education, physical activity, current cigarette smoking, weekly alcohol drinking, body mass index, LDL-cholesterol, plasma glucose, mean arterial pressure, estimated glomerular filtration rate (eGFR), and history of cardiovascular disease.

Conclusions: These data indicate that vascular calcification may be associated with increased arterial stiffness in patients with CKD independent of risk factors for arthrosclerosis.

PP.42.06 PHENOTYPIC EXPRESSION OF ESSENTIAL HYPERTENSION AND INTRARENAL RESISTANCE

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Objective: Renal resistive index (RI) reflects not only intrarenal, but also systemic haemodynamic conditions. The present study sought to determine the relationship between RI and the type of hypertension in patients with essential hypertension.

Design and method: A total of 275 consecutive, newly diagnosed, never treated, essential hypertensive patients grade 1-3, (mean age 51±14 year, 55% male), referred to the outpatient antihypertensive unit of our institution were studied. Diabetic individuals and those with overt cardiovascular or renal disease were excluded. The evaluation of target organ damages (OD) was performed in accordance to the European Society of Hypertension guidelines. Moreover, all patients underwent renal Doppler ultrasound with RI measurement. The mean value of RI from both kidneys was used for the analysis. Based on office and ambulatory blood pressure (BP) levels, the population was split in four groups: masked (17%), isolated systolic (ISH, 15%), isolated diastolic (IDH, 13%) and mixed (systolic-diastolic, SDH, 55%) hypertension.

Results: Patients with ISH were older, predominantly male, with more severe OD, less fit and with the highest RI (Table). Patients with IDH were younger, predominantly female with excellent OD profile, physically active and with the lowest RI. Between these two extreme clinical profiles were patients with masked and SDH, who were middle-aged with intermediate OD profile, moderately active and intermediate RIs. Multinomial logistic regression analysis (reference category IDH) revealed that RI (ISH vs. IDH: OR 1.24 with 95% CI 1.08-1.40 - p=0.001, Masked vs. IDH: OR 1.13 with 95% CI 1.03-1.25 - p=0.008, SDH vs. IDH: OR 0.94 with 95%CI 0.84-1.04 - p=0.263), pulse pressure and heart rate were independent determinants of hypertension type after adjustment for age, gender, abdominal obesity and glomerular filtration rate.

	Masked	ISH	IDH	SDH	p-value
Age, years	53±17	59±14	44±12	49±12	<0.001
Gender, % male	42	64	37	61	0.006
Abdominal obesity, %	35	51	22	50	0.008
Office systolic blood pressure, mmHg	131±7	147±8	135±4	158±16	<0.001
Office diastolic blood pressure, mmHg	86±7	82±7	95±4	111±9	<0.001
Office heart rate, beats per minute	70±10	72±13	84±13	81±12	<0.001
24-hour systolic blood pressure, mmHg	121±7	126±9	122±11	129±12	<0.001
24-hour diastolic blood pressure, mmHg	76±8	69±9	79±8	79±8	<0.001
24-hour heart rate, beats per minute	69±8	69±9	79±9	74±8	<0.001
Albumin-to-creatinine ratio, mg/g	9 (6-13)	10 (6.5-30)	7 (5-13)	9 (6-16)	0.220
Glomerular filtration rate, ml/min	104±40	97±43	115±30	116±37	0.027
Plasma creatinine, mg/dl	0.85±0.18	0.84±0.17	0.87±0.14	0.90±0.19	0.250
Carotid femoral pulse wave velocity, m/sec	7.8±2	8.8±2	8.6±1.6	8.6±2	0.012
Left ventricular mass index, kg/m²	79.9±15.8	82.8±18	83.8±19.3	88.9±19.8	0.015
Tissue Doppler imaging mean annular Em/Am	0.97 (0.8-1.3)	0.86 (0.7-1.1)	0.96 (0.7-1.3)	0.99 (0.7-1.1)	0.012
Mean common carotid intima-media thickness, mm	0.69 (0.60-0.82)	0.72 (0.63-0.83)	0.56 (0.53-0.67)	0.63 (0.56-0.74)	<0.001
Treadmill stress test, metabolic equivalents	11±2.6	9±3.5	12±1.8	11±2.3	0.004
Renal resistive index	0.64±0.06	0.67±0.06	0.58±0.05	0.60±0.06	<0.001

Conclusions: Renal resistive index is closely associated both with systolic and diastolic BP and is an independent determinant of hypertension phenotype.

PP.42.07 INTRADIALYTIC HYPERTENSION IN HEMODIALYSIS PATIENTS TREATED WITH ERYTHROPOETIN

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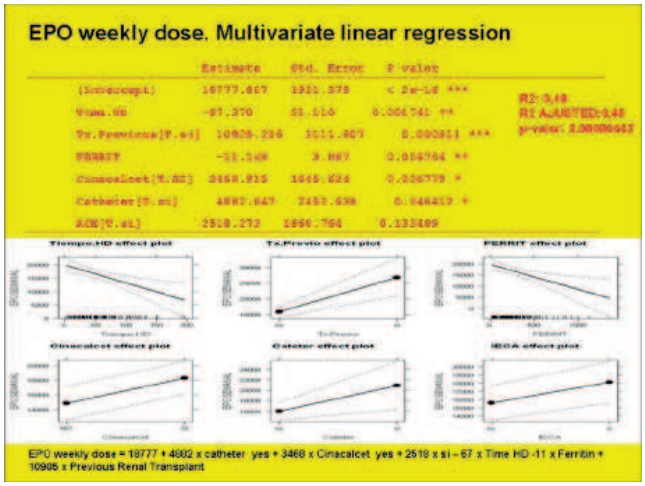
Objective: Intradialytic hypertension not diminish with Ultrafiltration. Treatment of anemia with Erythropoetin is associated with increased peripheral vascular resistance increased hematocrit, increased plasma levels of endothelin and decreased nitric oxide synthesis, stocks that worsen hypertension control.

Design and method: We studied 187 patients with CRF-V in hemodialysis with a pattern of 4 hours / session / 3 sessions a week. Analyzed: age, sex, months

on hemodialysis, PTH, albumin, ferritin, Baking, weekly Erythropoetin dose / weight, and type of EPO, Hct, Hgb, Ab treatment. Folic Cinacalcet, paricalcitol, statins, type of heparin, if they had central venous catheter for vascular access, Kt / V, type and number of antihypertensive drugs, previous renal transplantation. Weekly doses of EPO and intradialytic hypertension as dependent variables. We used for statistics SPSS 15 and R-RComander. Univariate analysis was first performed by Chi2 test with risk analysis, mean comparison and multivariate binary logistic regression and multiple linear regression.

Results: Patients with doses> 450 U / kg / week were younger and took as many hypotensive treatment. In the comparison of proportions, we found that the group with the highest dose of Epo had intradialytic hypertension, had a previous kidney transplant, and were being treated with ACE inhibitors. The variables that explain the weekly dose of EPO after multivariate linear regression are positively correlated: Having placed a central venous catheter over supposed Epo 5000 U / week, previous renal transplantation involves 11,000 units of EPO weekly treatment with Cinacalcet 4800 . Inverse relationship with the weekly dose of EPO in hemodialysis time and ferritin.



Conclusions: 1.The previous renal transplant hypertension increases the risk of intra-dialysis more than 3-fold relative to non-transplant.
2. The dose of EPO> 450 U / kg / week is a risk factor of hypertension during dialysis, multiplying their risk by 6.
3. Hemoglobin and Kt / V protective factors and that a higher level of RR decrease intradialytic hypertension in 42% and 32% respectively.

PP.42.08 THE NEGATIVE CORRELATION BETWEEN C-REACTIVE PROTEIN AND SERUM ALBUMIN IN CHRONIC HEMODIALYSIS PATIENTS

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Objective: Cardiovascular disease, especially atherosclerosis, is the most important cause of increased mortality in hemodialysis patients.
High levels of CRP are a strong prognostic factor for cardiovascular morbidity and mortality both in non uremic and uremic patients. Hypoalbuminemia (Low serum albumin, Salb) is a powerful risk factor for cardiovascular mortality in hemodialysis patients.
The aim of this study was to evaluate the prevalence of CRP and its correlation with serum albumin.

Design and method: The study involved 25 stable hemodialysis patients. All the patients were treated with HD three times a week, for at least 7 months. The average age of patients was 45.04 years.
The levels of CRP and Salb have been measured.
The patients were divided in two groups based on the levels of CPR.
The first group comprised patients that presented CPR levels lower 6 mg/l and the second group comprised those presenting CRP levels higher than 6mg/l.

Results: 52% of the patients presented CRP levels higher than10mg/l, 60% presented CRP levels > 5mg/l and only in 40% of them CPR levels were lower than 3mg/l. 56% of the patients presented albumin levels <4gr/dl.
A negative correlation between CPR>6mg/l and serum albumin<4mg/dl has been found. (r = -0.25, p<0, 03).

Conclusions: Hemodialysis patients presented higher levels of CRP. The patients which presented hipoalbuminemia had elevated levels of CRP.

PP.42.09 THE IMPACT OF FLUVASTATIN ON HYPERLIPIDEMIA AND PROTEINURIA IN PATIENTS WITH NEPHROTIC SYNDROME

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Objective: Hyperlipidemia is found very often in patients with glomerular diseases, particularly if severe proteinuria is present.
Hyperlipidemia in nephrotic syndrome (NS) results from increased synthesis and decreased catabolism. It is characterized by high levels of total cholesterol (Tchol), triglycerides (TG), LDL and VLDL, while HDL may be normal
Some data suggest that lipid metabolism disorders might contribute to kidney damage.
Statins are supposed to have a reno-protective role and also reduce hyperlipidemia in patients with NS.
The aim of this study is to asses the impact of HMG-CoA reductase inhibitor Fluvastatin on dyslipidemia and proteinuria in patients with NS.

Design and method: The study was performed on 22 patients (13 males and 9 females), over 18 years old (mean age 38.5± 11 years) with glomerular filtration rate (GRF) over 90ml/min and NS with severe hyperlipidemia.
All the patients were treated with corticosteroids alone or in combination with immunosuppressive drugs, but all the patients presented resistance to the treatment.
In addition, the patients were also treated with fluvastatin, at 40 mg daily for a period of 3 months.
The measurements of Tchol, TG, LDL, HDL and proteinuria were realized before and after treatment.

Results: The patients presented T Chol levels of 347±81,4 before treatment and 183±0,76 after treatment p<0.001;
TG levels of 383±17 before treatment and 273±107 after treatment p<0,005
LDL levels of 150±36 before treatment and 101±33 after treatment p<0,001
HDL levels were within normal range in all patients before and after treatment.
There was not observed any significant decrease in proteinuria. In fact, before treatment it was 4,3±1 and after treatment 3,03±1,2 p=0,01.

Conclusions: The 3 month treatment with fluvastatin didn't influence the proteinuria in patients with nephrotic syndrome. However, in order to asses better its impact on proteinuria a long term study is needed.
Fluvastatin demonstrated a great effectiveness in the treatment of hyperlipidemia, because it led to a significant reduction of hyperlipidemia in patients with nephrotic syndrome.

PP.42.10 DIAGNOSTIC AND PROGNOSTIC VALUE OF ACUTE KIDNEY INJURY BIOMARKERS IN PATIENTS WITH ACUTE CORONARY SYNDROME

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Objective: Acute kidney injury (AKI) is associated with high morbidity and mortality. 2012 KDIGO criteria of AKI are based on serum creatinine (sCr) and urine output, but a reliable tool to early AKI diagnose is still lacking. Several potential early predictive biological markers of acute AKI have been suggested. The aim of the study was to evaluate the prognostic value of biomarkers (urine neutrophil gelatinase-associated lipocalin (uNGAL), urine interleukin-18 (uIL-18), serum cystatin C (sCysC) depending the presence of AKI in patients with non-ST-elevation acute coronary syndrome (NSTE-ACS).

Design and method: 288 patients (36% male, 72±12 years (M±SD), body mass index 28±5 kg/m², 8% smokers, diabetes mellitus 23%, previous myocardial infarction (MI) 42%, arterial hypertension 92%, heart failure 36%, atrial fibrillation 23%, known chronic kidney disease (CKD) 16%, blood pressure 142±31/81±15 mmHg, serum creatinine (SCr) 108±55 mumol/l, GFR MDRD 61±23 ml/min/1.73 m²) admitted in intensive care unit with NSTE-ACS (NSTE-MI 66,5%) were examined. AKI was diagnosed according to KDIGO 2012 Guidelines. Early AKI was diagnosed by SCr decrease during hospitalization compared with SCr on admission. Late AKI was diagnosed by SCr increase during hospitalization. Mann-Whitney and Spearman tests were performed. P<0.05 was considered statistically significant.

Results: Prevalence of AKI in NSTE-ACS was 37%. Early AKI was diagnosed in 56%, late AKI in 44%. AKI de novo was established in 80%, AKI on CKD in 20%. Patients with NSTE-ACS and early AKI compared with patients without

AKI had higher sCysC (13143 vs 9273 ng/ml, p<0.01), uNGAL (333 vs 98 ng/ml, p<0.05) and uIL-18 (571 vs 542 pg/ml , p<0.05) on admission. Levels of biomarkers did not differ in patients with late AKI and without AKI. Patients with AKI on CKD compared with AKI de novo had higher uNGAL (508 vs 24 ng/ml, p<0.01) and IL-18 (578 vs 565 pg/ml, p<0.05) on admission. No relationship between biomarkers and in-hospital mortality was revealed in patients with AKI.

Conclusions: In patients with NSTE-ACS biomarkers of AKI – sCysC, uNGAL, uIL-18 - were markers, but not predictors of AKI. Biomarkers of AKI in studied NSTE-ACS population had no prognostic value.

PP.42.11 CAVEOLIN-1 MODULATED RENAL NITRIC OXIDE SYNTHASE DURING HEMORRHAGIC SHOCK WITH AGING

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Objective: Endothelial nitric oxide synthase (eNOS) plays a critical role in the regulation of renal function. Caveolin-1 is an negative regulator of eNOS activity. NO system and caveolin-1 have been identified as modulators of the normal aging process. To evaluated the effect of caveolin -1 on the activity of renal NO system following acute hemorrhage (H) with aging.

Design and method: Groups of young and adult animals: Group C, controls rats ; Group H : rats subjected to H of 20% of blood volume . At 120 min of bledding, we measured NOS activity (in vitro method and NADPH-diaphorase assay). Protein levels of the isoforms of NOS and caveolin -1 was determined by Western blot. eNOS was immunoprecipitated with anti-caveolin-1 antibodies from whole kidney extracts of young and aged rats.

Results: Aging decreases renal NOS activity, while H causes an increase in this parameter in young and adult animals (Group C young : 309 ± 24 pmol.g tej -1.min -1 Group H young : 499 ± 20 * pmol.g tej -1.min- 1, Group C adult: 249 ± 17 <> pmol.g tej -1.min- 1, Group H adult: 449 ± 16 * pmol.g tej -1.min -1 , *p < 0.01 vs. C group of each age group ; <> p < 0.01 vs. young C group). The changes observed in NOS activity were at the expense of changes in histochemical activity in the renal medulla. No changes were observed in the protein levels of the isoforms of NOS and caveolin-1. Immunocolocalization of eNOS and caveolin -1 showed that: a) there was an increased association of eNOS with caveolin-1 with aging , b) H caused a greater dissociation of the complex eNOS/caveolin-1.

Conclusions: The present study demonstrated the involvement of caveolin-1 in the regulation of renal NOS activity in H and aging. The reduced NOS activity observed in aged rats could be due to increased association of eNOS with caveolin-1. H constitutes a stimulus for the dissociation of complex eNOS/caveolina-1 adjusting NO production to the needs of renal tissue to H. This response was independent of age.

PP.42.12 EVALUATION OF DIURETIC'S EFFICACY IN PATIENTS WITH CHRONIC KIDNEY DISEASE AND HYPERTENSION ASSESSED BY AMBULATORY BLOOD PRESSURE MEASUREMENTS

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Objective: The aim of this study was to evaluate the efficacy of diuretics in blood pressure control in hypertensive patients with chronic kidney disease (CKD), based on 24hr ambulatory blood pressure(ABP) monitoring.

Design and method: A cross-sectional study was conducted with 51 hypertensive patients with chronic kidney disease stage III to V (36 males, 15 females), mean age 65.36±11.75, mean eGFR 30.6±12.4 ml/min/1.73 m2, and mean number of antihypertensive drugs 2.5±1.3. Among those 24 subjects were on diuretic therapy. ABP was measured with Microlife WatchBP O3 device and controlled blood pressure was considered as mean BP 24hr <130/80 mmHg, mean awake BP <135/85 mmHg and mean asleep BP <120/70 mmHg. Chi-square test was applied in order to correlate blood pressure control and intake of different categories of antihypertensive drugs while independent sample t-test analysis was applied between ABPM measurements and the intake of diuretics.

Results: Comparing blood pressure control with the intake of centrally acting drugs, calcium channel blockers, b-blockers and renin angiotensin system (RAS) inhibitors/blockers we found non significant relationship (p>0.05). On the other hand blood pressure control was strongly associated with the intake of diuretics agents (p=0.004). Further analysis showed strong correlation between diuretic intake and systolic 24hr-ABP (p=0.036), diastolic 24hr- ABP (P=0.007), diastolic awake ABP (p=0.008) diastolic asleep ABP (p=0.028).

Conclusions: Diuretic agents seem to be most effective in controlling blood pressure in patients with CKD compared to other antihypertensive agents, confirming the need of diuretics as first-line drugs in patients with CKD and hypertension assessed by ABP measurements.

PP.42.13 EVALUATION OF THE EVENING DOSAGE OF ANTIHYPERTENSIVE DRUG IN BLOOD PRESSURE CONTROL AND DIPPING STATUS IN PATIENTS WITH CHRONIC KIDNEY DISEASE

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Objective: To investigate whether the antihypertensive medication later in the day or at bedtime provokes a better control of hypertension and reduces non dipping status in hypertensive patients with chronic kidney disease (CKD).

Design and method: A cross-sectional study was conducted on 51 hypertensive patients with chronic kidney disease stage III to V (36 males, 15 females), mean age 65.36±11.75, mean eGFR 30.6±12.4 ml/min/1.73 m2 and mean number of antihypertensive drugs 2.5±1.3. Among those 29 subjects were receiving evening dose of antihypertensive drug. Ambulatory blood pressure was measured with Microlife WatchBP O3 and controlled blood pressure was considered as mean BP 24hr <130/80mmHg, mean awake BP <135/85mmHg and mean asleep BP<120/70 mmHg. Chi-square test was applied in order to correlate evening dose of antihypertensive drug with blood pressure control and dipping pattern while independent sample t-test analysis was applied between evening dose of antihypertensive drug and ABPM measurements.

Results: Among the patients studied 21 had controlled blood pressure and 41 were non dippers. Evening dose of antihypertensive drug was not correlated neither with blood pressure control nor with the dipping pattern (p>0.05). Further analysis did not demonstrate correlation between evening dose and systolic-diastolic 24hr, awake and asleep ABPM measurements (p=0.67, p=0.843, p=0.86, p=0,903, p=0.125, p=0.902 respectively).

Conclusions: Evening dose of antihypertensive drug seems not to ameliorate the non dipping status and the BP control of hypertensive patients with CKD. Thus, our data do not support the administration of the medication later in the day or even at bedtime.

PP.42.14 LONG-TERM EVALUATION OF CORONARY CALCIFICATIONS IN KIDNEY TRANSPLANTED PATIENTS: A FOLLOW-UP OF 5 YEARS

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Objective: Patients with chronic kidney disease(CKD) have a relevant cardiovascular(CV) risk. Vascular calcification, particularly at coronary levels, have been related to the increased CV mortality. Few data are available on the long term behaviour of coronary artery calcifications(CAC) in kidney transplantation (KTx). Using coronary CT performed at 1month and 5years after KTx we evaluated: 1) the prevalence of CAC; 2) the clinical and biochemical factors related with CAC; 3) the factors implicated with CAC progression.

Design and method: We evaluated 87pts (M=51;mean age 47±12years) transplanted in our unit between 2007 and 2008. Clinical parameters, blood and urinary samples were collected for five years. For the analysis the mean value of these evaluations was considered. At baseline and after 5years from KTx a coronary TC for the evaluation of (CAC) using Agatson score was performed. According to the score obtained, patients were categorized in 4groups both at baseline and at 5th year: 1)0-10; 2)10-100; 3)100-400; 4)>400. The progression of CAC was determined using the formula proposed by Sevrukov (AJR, 2005 Dec;185(6):1546-53).

Results: At baseline and at 5yrs, 43%and 33% of pts were in the 1stgroup, 15%and 17% in the 2nd, 24%and 23% in the 3rd and 13%and 26% in 4th, respec-

tively. CAC at 5yrs were significantly higher than baseline($p<0.0001$). Both at baseline and after 5yrs CAC correlated directly with the age($p=0.0001$;$p=0.0006$ resp.) and with each other ($p<0.0001$). Twenty-two percent of patients had a significant progression of CAC. They had lower levels of PTH and alkaline phosphatase all five years long. Moreover also in the 27%of patients, who worsened their category of CAC, PTH was significantly less. In a logistic model, PTH was the only independent factor inversely related with CAC progression. During the 5 year of KTx only 1patient dead for cerebral haemorrhage and 4 patients restarted dialysis all for chronic rejection.

Conclusions: The prevalence of CAC in CKD patient is quite high, and is related with their age. CAC worsening was observed only in a small part of patients with higher baseline CAC score. CAC progression resulted related with lower PTH and ALP levels.

PP.42.15 HYPERTENSION MANAGEMENT AMONG CHRONIC KIDNEY DISEASE PATIENTS WITH DIABETES

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Objective: Estimating the prevalence of CV risk factors among Hypertenssive Chronic Kidney Disease patients with diabetes. Identifying the drugs used in treating hypertension and determine how effective is the treatment in achieving the target blood pressure. Verifying the factors associated with uncontrolled BP. Determining the progression of renal function among those patients.

Design and method: Retrospective study. Adult patients with CKD and HTN identified from electronic records over a period of 8.5 years starting October 2004. Patient without lab data or without a follow up, pregnant, transplant and those with primary glomerulonephritis were excluded.
Age, gender, BMI, cardiovascular risk profile, kidney function and medications were recorded from the first as well as the last clinic visit. Calculated eGFR by CKD EPI equation. A sample of 64 diabetic patients was matched with 64 non diabetic for age, gender and BMI.

Results: The total CKD patients identified with hypertension were 223, of which 139 were having diabetes. Mean Follow up was 25 months. The mean age was 57 years (SE 0.5). Mean BMI was 28.6 (SE 2.1). Males constituted 67%. Higher prevalent CV risk factors was found among the diabetic subgroup. The mean systolic BP was lower in the non-diabetic patients 136.7mmHg (SE 2.7) as compared to 147mmHg (SE 3.2) in the diabetic subgroup. More antihypertension medication were used in the diabetic as compared to the non-diabetic. A higher percentage of the non-diabetic CKD patients achieved target blood pressure. 67% as compared to 52% among the diabetic. Diabetes, Stroke, Alpha blockers, Vasodilating Beta blockers and vasodilators were among the factors related significantly with uncontrolled BP. Although the mean eGFR reduced more in the diabetic subgroup over the follow up period but that difference was not statistically significant.

Conclusions: Hypertension CKD patients with diabetes have more CV risk factors, required more antihypertensive medications, more diabetic patients ended up having uncontrolled BP after 2 years of follow up. Diabetes, stroke, Alpha blockers, Vasodilating Beta blockers, Vasodilators and NTG were the significant factors associated with uncontrolled BP. Kidney function did not vary significantly among the two subgroups.

PP.42.16 PROGNOSTIC VALUE OF AMBULATORY BLOOD PRESURE MONITORING IN DIABETES

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Objective: Ambulatory blood pressure monitoring (ABPM) provides data of circadian pattern and better predicts cardiovascular risk (CVR).
An elevated prevalence of nocturnal blood pressure fall absence has been observed in patients with diabetes mellitus (DM).
Thus, the main objective was to assess the prognostic value of ABPM in a cohort of patients with DM followed for 10 years.

Design and method: A retrospective study was designed with a random cohort of 766 subjects with DM and hypertension. BP was measured by ambulatory monitoring along 24 hours with a Spacelabs 90207 device adjusting diurnal and nocturnal periods for each patient. Also clinical assessment and blood samples were analysed at the beginning.
Follow-up was based on retrospective review of medical records, and cardiovascular events were recorded (peripheral vascular disease-PVD, coronary artery disease-CAD, heart failure-HF or stroke-S).

Results: We completed the monitoring of 715 subjects (female: 374) and 319 vascular events were recorded.
Previous cardiovascular disease and diabetic nephropathy were worse clinical prognostic factors for cardiovascular disease as both establish increasing incidence of cardiovascular events.
Once ABPM data were analyzed, both nocturnal BP and reversal circadian pattern showed prognostic value and Kaplan-Meier survival curves reported worse cumulative CV event-free survival in non-dippers and risers.

Conclusions: Both nocturnal BP and loss of nocturnal BP fall identified by ABPM, in addition to previous cardiovascular disease (it includes renal dysfunction) better correlates with poor cardiovascular prognosis in patients with DM and hypertension which confirms the importance of prognostic value of ABPM as well as early diagnosis and management in such patients.

PP.42.17 LINKING ARTERIAL STIFFNESS TO THE BIOLOGICAL PROFILE OF INFLAMMATION AND COAGULATION AT HYPERTENSIVE PATIENTS WITH OR WITHOUT DIABETES MELLITUS

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Objective: The objective of the study was to estimate how the arterial stiffness (AS) correlates with the pro-inflammatory and pro-thrombotic unbalances at hypertensive patients (pts) with or without diabetes mellitus (DM).

Design and method: 50 hypertensive pts (mean age = 58.3 ± 9.8 years, 52% males) - group 1 and 50 hypertensive pts with DM, matched for age and sex (mean age = 59.7 ± 10.3 years, 54% males) - group 2. AS was evaluated by measuring carotid-femural pulse wave velocity (PWV) using SphygmoCor system. PWV greater than 12 m/s was considered abnormal. Inflammation profile was estimated by serum measurement of C reactive protein (CRP) and fibrinogen (F). Pro-thrombotic profile was determinate by serum measurement of von Willebrand factor (vWf), antithrombin III (AT III) and plasminogen activator inhibitor (PAI-1).

Results: In group 1, 22 pts (44%) had increased PWV: 12.4 ± 0.2 m/s. In group 2, 24 pts (48%) had increased PWV: 12.8 ± 0.5 m/s. The difference is not significantly statistic between the two groups ($p=0.08$). In group 1, increased PWV was significantly associated with higher level of CRP (1.88 ± 0.76 mg/L vs 6.43 ± 2.17 mg/L, $p=0.02$). In group 2, increased PWV was found in a significantly higher proportion at pts with higher level of CRP (2.21 ± 0.84 mg/L vs 8.53 ± 2.07 mg/L, $p=0.004$) and also with greater proportion of vWf (71.32 ± 24.76% vs 163.42 ± 31.85% , $p=0.001$) and with higher level of PAI-1 (0.38 ± 0.19 u/mL vs 0.66 ± 0.21 u/mL , $p=0.04$).

Conclusions: Hypertensive pts with DM have increased PWV in a greater but not significant proportion than hypertensive pts without DM. Increased PWV at hypertensive pts seems to reflect a proinflammatory status. Moreover, increased PWV at hypertensive pts with DM appears to express both pro-inflammatory status and pro-thrombotic unbalance.

PP.42.18 HYPERHOMOCYSTEINEMIA AND MTHFR POLYMORPHISM IN DIABETIC NEPHROPATHY

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Objective: Homocysteine (hcy) is an intermediate metabolite in the metabolic pathway of methionine and cysteine. Hyperhomocysteinemia (hmct) is an established, independent risk factor for atherosclerosis. The methylenetetrahydrofolate reductase (MTHFR) polymorphism has been shown to result in increased total hcy concentrations and low folate levels caused by a decreased enzyme activity. The aim of the present study was to determine hcy serum levels and to evaluate MTHFR-1 (C677T) and MTHFR-2 (A1298C) in patients with diabetes mellitus (DM) type 2 and diabetic nephropathy (DN) in early stages.

Design and method: 50 patients with CKD 1st and 2nd stage and DN were included as controls there were 40 healthy individuals.

Results: 40 of the patients had increased serum levels of hcy. From them 13 presented the polymorphism MTHFR-1 (75%) and 13 the MTHFR-2 (43%). From controls 5 presented HMCT, 3 presented the MTHFR-1 and 2 MTHFR-2.

Conclusions: Increased serum levels of MTHFR-1 C677T have been shown to be associated with HMCT in patients with DN.

PP.42.19 INCREASED SERUM LEVELS OF GELATINASE-A ARE CORRELATED WITH VASCULAR ENDOTHELIAL GROWTH FACTOR-A IN HYPERTENSIVE PATIENTS IN EARLY STAGES OF TYPE 2 DIABETIC NEPHROPATHY

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Objective: Gelatinase-A, reported also as matrix metalloproteinase-2 (MMP-2), is the main enzyme that degrades collagen type-IV (col-IV) and has been implicated in chronic kidney disease (CKD) and cardiovascular disease (CVD). It remains controversial the mechanism by which VEGF works in the kidney, as well as in the vessels at least in the early stages of diabetic nephropathy (DN) and CKD. Whether VEGF-A is detrimental in early stages of DN or other renal conditions has not yet been clearly answered. The aim of the present study was to determine the serum levels of MMP-2 and VEGF-A and to investigate their potential correlation with the atherosclerotic markers and albuminuria in hypertensive patients with early stages of type 2 DN.

Design and method: CKD patients of stages 1 and 2 with type II DN (n=40) were included. As controls, there were two groups, patients with diabetes type II without CKD (n=40) and healthy individuals (n=40). Clearance of creatinine (Clcr) and albumin excretion were examined in the 24h urine. VEGF-A and MMP-2 levels were measured by an ELISA method. Intima media thickness of carotid and femoral arteries and atheromatic plaque were evaluated by a high resolution ultrasonography

Results: There was a notable difference between VEGF-A and MMP-2 levels in each of the groups.The difference between VEGF-A serum levels in DN group and healthy individuals was 38460 ($p<0.0001$). The difference between levels of MMP-2 in DN and healthy individuals was 34132 ($p<0.0001$).MMP-2 levels indicated a strong positive correlation with albuminuria in patients as opposed to controls ($p<0.0001$).MMP-2 serum levels were strongly correlated with VEGF-A serum levels in the group of DN (pearson correlation 0.520, $p<0.0001$). There was a statistically significant correlation between levels of VEGF-A, MMP-2 and albuminuria ($p<0.0001$). Further, VEGF-A and MMP-2 levels were independently correlated with IMT and atheromatic plaque ($p<0.0001$).

Conclusions: Our study suggests that serum levels of VEGF-A and MMP-2 might present independent risk factors of hypertension, atherosclerosis and albuminuria, at least in the early stages of type II diabetic nephropathy to the progression of CKD.

PP.42.20 MATRIX METALLOPROTEINASE-2 IS ASSOCIATED WITH OXIDATIVE STRESS IN HYPERTENSIVE PATIENTS WITH TYPE 2 DIABETIC NEPHROPATHY IN EARLY STAGES

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Objective: Matrix metalloproteinase-2 (MMP-2) is considered to be the main enzyme that degrades col-IV and has been implicated in chronic kidney disease (CKD) and cardiovascular disease (CVD). Collagen type-IV (col-IV) is the major collagenous component of the extracellular matrix (ECM) which constitutes the architectural structure of the vessels' basement membrane (BM) and the glomerular BM (GBM). The evolution of oxidant stress from early stages of renal function decline is not fully clear. The concentration of 15-F2t-isoprostane (15-F2t-IsoP) in serum has been considered as a reliable biochemical index of oxidative stress in patients with several pathological conditions including diabetic nephropathy (DN) and CKD. However, there is no knowledge about the potential correlation between MMP-2 serum levels and oxidative stress in hypertensive patients in early stages of type II DN. The aim of this study was to investigate the serum levels of MMP-2 and their potential correlation with 15-F2t-IsoP in early stages of type II DN.

Design and method: CKD patients of stages 1 and 2 with type II DN (n=40) were included and 18 of them were hypertensive. Patients with active inflammatory disease or malignancy were excluded. As controls, there were two groups, patients with diabetes type II without CKD (n=35) and healthy individuals (n=35). MMP-2 and 15-F2t-IsoP levels were measured by an ELISA method. Intima media thickness (IMT) of carotid and femoral arteries and atherosclerotic plaque were determined by a high resolution ultrasonography.

Results: The levels of MMP-2 were significantly higher in patients than in the control groups and their difference is 34132 ($p<0.0001$). The difference between 15-F2t-IsoP levels in patients and in controls is 15510 ($p<0.0001$). Clcr and albumin excretion levels were statistically different between patients and controls ($p<0.001$), as well as in all four groups ($p<0.001$). Further, MMP-2 levels were independent correlates of oxidative stress, IMT as well as of atherosclerotic plaque ($p<0.01$). This association seems stronger under the presence of hypertension.

Conclusions: This study suggests that serum levels of MMP-2 were found to be independent risk factors of oxidative stress and hypertension in early stages of type II diabetic nephropathy.

PP.42.21 GENDER DIFFERENCES IN THE MANAGEMENT OF HYPERTENSION IN DIABETIC PATIENTS

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Objective: The treatment and control rates of hypertension exhibit some differences between diabetic men and women. The objective of the study was to determine the gender differences in the clinical management of arterial hypertension in patients with diabetes.

Design and method: The study included 187 patients with arterial hypertension and diabetes hospitalized in the Internal Medicine Clinic of a University Emergency Hospital. We analyzed data from the hospital record database.

Results: The distribution by sex: 83 men (44.39%) and 104 women (55.61%). Women were older than men (mean age 71±3 years vs 67±4 years) and had higher values of systolic and diastolic blood pressure, heart rate and total cholesterol than men. Regarding the treatment, the majority of patients were taking at least 2 antihypertensive agents: 5.88% one drug, 66.31% two drugs, 18.18% three drugs and 5.34% four drugs. There was no significant difference between the number of antihypertensive drugs in both sexes. Instead, women were treated with more antidiabetic agents; also, more women received insulin (33.65% vs 19.27%). More women than men were treated with betablockers (13.46% vs 9.63%) and diuretics (34.61% vs 27.71%). More men received angiotensin converting enzyme inhibitors (44.57% vs 29.80%). Blood pressure was better controlled in men than women (40.96% vs 27.88%).

Conclusions: Hypertensive diabetic women from our study were older than men. There were no gender differences in the number of drugs prescribed, but men were more frequently treated with angiotensin converting enzyme inhibitors and women with diuretics or betablockers. The majority of hypertensive diabetic patients, independent of gender, were treated with dual antihypertensive therapy. Diabetic hypertensive women had lower control rates of hypertension.

PP.42.22 EFFECT OF LIRAGLUTIDE ON 24-HOURS AMBULATORY BLOOD PRESSURE IN HYPERTENSIVE PATIENTS WITH TYPE 2 DIABETES MELLITUS

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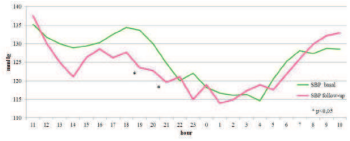
Objective: Hypertension is often associated with type 2 diabetes mellitus (T2DM) and is closely related to an increase of Cardiovascular Risk.
Previous studies (LEAD ® studies) support the effectiveness of ancillary effect of glucagon-like peptide-1 receptor agonist (GLP-1 RA) on reduce blood pressure values. In particular Liraglutide is able to decrease office systolic blood pressure (SBP) between 2.7 and 6.6 mmHg after 6 months of therapy.

The aim of this study was to investigate the effect of Liraglutide on 24-Hours Ambulatory Blood Pressure (ABPM).

Design and method: 10 hypertensive and T2DM patients (mean age 64 years; mean T2DM duration 9.6 years; mean BMI 34.9 kg/m²) on drug therapy with good blood pressure control (mean office blood pressure: 135/82 mmHg), underwent to ABPM (Spacelabs 90207) before and after 4 months of treatment with Liraglutide. Statistical analysis performed with IBM SPSS software.

Results: Delta blood pressure values at the baseline and after treatment are collected in the following table, SBP profile on 24 hours is shown in the graph.

	Δ SBP		Δ DBP		Δ HR	
Patients	*Daytime*	*Nighttime*	*Daytime*	*Nighttime*	*Daytime*	*Nighttime*
1	-12,2	5,4	-8,0	7,7	6,2	5,9
2	0,8	-5,1	8,5	-1,6	3,5	-5,7
3	-5,2	2,9	-0,9	3,9	6,7	8,1
4	-5,5	2,3	-1,9	5,9	-1,9	3,3
5	-5,3	-4,0	-5,2	-2,9	8,8	5,1
6	-1,9	-16,4	-0,1	-4,4	20,3	5,6
7	-19,6	-5,1	-1,6	3,6	0,9	11,8
8	0,5	3,0	5,6	3,4	-4,2	4,4
9	4,5	5,3	5,4	4,3	0,2	0,3
10	5,2	3,7	3,5	4,7	2,5	14,1



An improved dipping pattern on ABPM at 4 months of therapy were shown by some subjects.
In the postprandial hours a marked drop in blood pressure was observed, although statistical significance was achieved in the late afternoon.

Conclusions: This study confirms that Liraglutide could reduce systolic blood pressure.
No significant differences were observed on diastolic blood pressure.
More results might be achieved with a larger sample and with higher baseline blood pressure values.

PP.42.23 THE FINNISH DIABETES RISK SCORE (FINDRISC) AS AN INDICATOR OF THE GLYCEMIC PROFILE OF NON-DIABETIC HYPERTENSIVES

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Objective: The Finnish Diabetes Risk Score questionnaire (FINDRISC) is a practical validated tool to estimate the risk for future type 2 diabetes mellitus (T2DM). This study sought to evaluate the potent associations of the FINDRISC with the metabolic profileof newly-diagnosed essential hypertensives (EH).

Design and method: 757 consecutive non-diabeticpatients (52±13 years, 53% males, body mass index 29±5kg/m²) were studied.Fasting plasma glucose (FPG), 2-hour post-load glucose (2hPG) and HbA1c were measured. Patients with all three measures in the normal range were considered as euglycemic, while those with more than one measure in the prediabetic range were considered as having advanced glycemic impairment (AGI). Age, BMI, waist circumference, history of antihypertensive drug treatment and high blood glucose, physical activity and daily consumption of fruits and vegetables were determinedfor the calculation of FINDRISC. The score ranges from 0 to 26 points with higher score representing higher T2DM 10-year risk.

Results: The glycemic profile of the participants was as follows: euglycemic 56.34%, impaired fasting glucose (IFG) 22.8%, impaired glucosetolerance(IGT) 0.26%, impaired HbA1c 10.6%, while 10% of the patients presented AGI. The prevalence of pre-diabetes and metabolic syndrome (MS; IDF criteria)was 48% and 53%, respectively.Regarding FINDRISC, 13.4% of patients hadscore <7, 37.1%7-11, 21.6%12-14, 24.1% 15-20 and 3.8% >20. Euglycemic patients had score 10±4 while pre-diabetics 14±4($p<0.05$). MS patients had FINDRISC 14±4 while non-MS patients 9±4 ($p<0.05$). The score was 14±4 in AGI, 13±4 in IFG and 12±4 in impaired HbA1c.54.1% of patients with score>=12 had at least oneglycemic measureabnormal,while 67% of those with score<12 had all measuresnormal. FINDRISK was correlated to FPG ($r=0.32, p<0.001$), 2hPG ($r=0.23, p=0.027$) and HbA1c ($r=0.29, p<0.001$). The area under ROC curve for FINDRISC to detect dysglycemia was 0.67 (95%CI 0.63-0.71), with the optimal cut-off level being 11 points (sensitivity 72%, specificity 61%).

Conclusions: Almosthalf of middle-aged, newly-diagnosed hypertensives are pre-diabetics. The FINDRISC is proved as a useful, cost-effective tool for identifying these individuals.

PP.42.24 RELATIONSHIP BETWEEN SOCS-3 GENE POLYMORPHISM AND ABNORMAL GLUCOSE METABOLISM IN THE XINJIANG UYGUR POPULATION

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Objective: To investigate the relationship between SOCS-3 gene polymorphism and abnormal glucose metabolism in Xinjiang Uygur population.

Design and method: According to different plasma glucose levels, 1232 individual in xinjiang hetian area were divided into 3 groups that is 451 patients with pre-diabetes(PD group),252 patients with type 2 diabetes mellitus (T2DM group) and 529 healthy people as normal controls (NC group). Based on HapMap we selected the polymorphismsrs rs12953258,rs4969168 ,rs9914220as haplotypes,tagging SNP (htSNP) sufficiently covering the genetic variation of the whole gene. We therefore examined the association between rs12953258,rs4949168and rs914220within SOCS-3 and abnormal glucose metabolism in the Xinjiang Uygur population in three independent study populations; The genotype and allele frequencies and relative clinic data were compared among groups.

Results: The T2DM study with 451 individuals showed the thomozygosity for the C allele of rs12953258 polymorphism of SOCS-3 was associated with increased diabetes risk(OR=1.756,95%CI(1.168,2.640)). In addition, association between rs4949168,rs914220 and abnormal glucose metabolism in the Xinjiang Uygur population was not found. Age,total cholesterol(CHOL) and BMI were risk factors of DM development,total cholesterol(CHOL)and low high-density lipoprotein (HDL-C)was risk factors of PD development in Uygur people.

Conclusions: The C allele of rs12953258 polymorphism of SOCS-3 gene may be an independent risk factor for abnormal glucose metabolism in Xinjiang Uygur population.

PP.42.25 BENEFICIAL EFFECTS OF PURIFIED SARDINE PROTEINS ON HYPERGLYCEMIA AND REDOX STATUS IN TYPE 2 DIABETIC RATS

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Objective: This study was designed to examine the effect of purified sardine proteins on hyperglycemia and redox status in streptozotocin-induced diabetic rats fed a high fat diet (HFD).

Design and method: Type 2 diabetes was induced by a high fat diet and low dose streptozotocin (STZ). Diabetic rats were randomly divided into four groups and were fed casein (CAS) or sardine proteins (SP) combined with 30% or 5% lipids, for 4 weeks. Serum and liver Cholesterol total (CT) and triacylglycerols (TG) were quantified. In liver and serum, oxidative stress was determined by thiobarbituric acid reactive substances and hydroperoxides determination. The antioxidant defense was evaluated by measuring superoxide dismutase (SOD), glutathione peroxidase (GPx), glutathione reductase (G-Red) and catalase (CAT) activities.

Results: HFD with CAS or SP increased serum glucose, insulin resistance (HOHA-IR), serum and hepatic TC and TG. In contrast, these parameters lowered in rats fed SP combined with 5 or 30% lipids. Serum insulin values were reduced by 51% in SP vs CAS. In the serum and liver, the TBARS and hydroperoxides were increased in rats fed HFD, whereas, in CAS-HF vs CAS, carbonyls were increased by 50% in the liver. Conversely, serum and liver TBARS, hydroperoxides and carbonyls were significantly decreased in rats fed sardine proteins whatever the containt of the lipids 5% or 30% in the diet. Serum SOD, Gred and CAT were decreased in rats fed HFD. Similary, in the liver, SOD, GPx, Gred and CAT were reduced by (47%), (65%), (90%) and (33%), respectively, in CAS-HF vs CAS group. However, a significant increased in the serum and hepatic antioxidant enzymes activities were observed in rats fed sardine proteins whatever diet (5% or 30% lipids).

Conclusions: These findings indicate that purified sardine proteins may be effective for correcting hyperglycemia and preventing diabetic complications by potentiating the antioxidant defense system in high fat diet/streptozotocin diabetic rats.

PP.42.26 NEPHROANGIOSCLEROSIS AS CAUSE OF CHRONIC RENAL FAILURE IN TYPE 2 DIABETES: LONG-TERM OUTCOMES AFTER A MULTIFACTORIAL THERAPEUTIC INTERVENTION

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Objective: To evaluate clinical-therapeutic long-term impact of nephroangiosclerosis (NAE) as a cause of CRF in patients with Type 2 Diabetes (2DM).

Design and method: We performed a retrospective,cross-sectional, analysis of 960 2DM patients with CRF (eGFR < 60 ml/min/1,73m2) followed in our reference Service for an average of 72± 15 months (range:12 - 128). According to the ethiology of CRF 794 (82,7%) were NAE (Mean age 67±12 years. 62% males. Initial sCreatinine (sCr) from 1,6 to 3,4 mgdl), 142 (14,5%) were Establish Diabetic Nephropathy, and 24 (2,8%) other ethiologies. Anthropometric and clinical features (BMI, Waist circunference, BP and associated Vascular RFs and Cardiovascular complications,evolution of metabolic parameters and renal function (sCr,eGFR and urinary protein excretion rate (UAER), as well as treatment applied to patients during follow up were o analyzed.

Results: Prevalence associated VRFs and CVCs (%) (Males vs Females): Hypertension (99,7 - 100), Obesity (56 - 58), Central Obesity (76 - 69(*)), Dyslipidemie (88 - 79 (*)), Metabolic Syndr. (66 - 62 (*)), Smoking (24 - 8 (*)), Stroke (5,5 - 4,2), IHD (46 - 29 (**), CHF (10 - 7,3) and Peripheral Artery Disease (34 -15 (*)). Initial vs final values in follow-up: BP (mmHg): (158±16 / 94±10 vs 136±11 / 81±7 (**); sCr (mgdl) (2,13±0,7 vs 1,76±1,1 (*)), eGFR MDRD (ml/min) (42±13 vs 46±18 (ns). UAER (mg/24 h.). (890±210 vs 118±82 (**). LDl-ch (mgdl): 146±36 vs 102±23 (**). BP < 140/90 mmHg (%): (36 vs 82 (**) and LDL-ch < 100 mgdl (24 vs 76% (**). Doubled sCr values:77 - 9,7%. Patients who entered in dialysis. 27 - 3,4%. 6 patients died due to cardiac events. (*) p<0.05, (**) p<0.001). Therapeutic regimen at end follow up:Use of statins: 92%, Antiplatelet 83%, Antihypertensives (%). RAS blockers (97), CC Blockers (74),Loop Diuretics (88), Betablockers (39), Carvedilol (62) and Doxazosin (59).

Conclusions: NAE is the first cause of CRF in type 2 diabetic patients, being more common in men who also had a worse cardiometabolic risk profile. A multifactorial therapeutic approach can stabilize longterm renal function to ESRD in most patients.

PP.42.27 THIOREDOXIN INTERACTING PROTEIN (TXNIP) IS RELATED TO BETA CELL DYSFUNCTION AND INCREASING MARKERS OF OXIDATIVE STRESS IN TYPE-2 DIABETIC PATIENTS

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Objective: To evaluate the expression of TXNIP and cytokines (IL-1beta, IL-6 and TNF-alpha) in peripheral mononuclear cells from type-2 diabetic patients with normal and obese nutritional status.

Design and method: 20 type-2 diabetic males with normal nutritional status (DM); 20 obese type-2 diabetic subjects (OBDM) and 20 controls (Cn) were evaluated. We determine biochemical parameters: fasting glycemia, glycosylated hemoglobin (HbA1c), hsCRP, TBARS, AGES, 8-isoprostanes, heme oxygenase activity (HO) and lipid profile. We extracted total RNA from peripheral mononuclear cells and the RNAm relative abundance of TXNIP, IL-1beta, IL-6 and TNF-alpha was measured by qRT-PCR.

Results: OBDM subjects had higher weight, BMI and abdominal circumference than DM and Cn (One way ANOVA, p<0.0001). In biochemical parameters we found that DM had higher fasting glycemia than OBDM and Cn (One way ANOVA, p=0.0034), however OBDM had higher HbA1c and hsCRP than DM and Cn (One way ANOVA, p<0.0001 and p=0.0158, respectively). In terms of oxidative stress, DM had higher HO activity than OBDM and Cn (One way ANOVA, p=0.0024), TBARS and AGES were increased in both DM and OBDM (One way ANOVA, p<0.0001 and p=0.0008, respectively). The expression of TXNIP was significantly higher in DM than Cn and OBDM (Kruskal Wallis, p=0.0074); IL-1beta, IL-6 and TNF-alpha relative abundance were higher in DM and OBDM, being IL-6 and TNF-alpha especially higher in OBDM (Kruskal Wallis, p<0.0001, for all of them). TXNIP expression was correlated positively with fasting glycemia and AGES in DM (r=0.72, p=0.006; r=0.59, p=0.0067, respectively) and negatively with HOMA-beta (r=-0.44, p=0.0386, respectively). In OBDM subjects there were no correlation.

Conclusions: The data suggest that the control of the fasting glycemic independently to the nutritional status represents the higher risk factor for beta cell dysfunction and increasing of oxidative stress markers.

PP.42.28 URINARY PLASMIN ACTIVATES THE EPITHELIAL SODIUM CHANNEL IN DIABETIC NEPHROPATHY

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Objective: In nephrotic syndrome, plasminogen is aberrantly filtered from plasma to preurine and activated by urokinase-type plasminogen activator (uPA) to plasmin that may activate the epithelial Na+ channel (ENaC) by proteolytic cleavage. At low plasmin concentration cleavage of ENaC involves prostasin. Diabetes is often accompanied by hypertension and microalbuminuria. We hypothesized that plasmin is lost to preurine in diabetic nephropathy and that urinary plasmin may activate ENaC current.

Design and method: Cross-sectional study including type 1 diabetes patients with nephropathy (n=19) or without nephropathy (control, n=19) matched on age, gender and diabetes duration. Plasma, spot urine samples, 24 h urine collections and 24 h blood pressure recordings were obtained.

Results: 24 h urinary protein excretion was 1.8±0.5 (nephropathy) and 0.07±0.03 g/day (control, p=0.0007). Urinary plasmin(ogen)/creatinine ratio (172±1.9×10-3 vs. 3.48×10-1 ±1.3×10-3 µg/g, p<0.0001) and urinary prostasin/creatinine ratio (33.8±5.5 vs. 9.4±2.2 µg/g, p<0.0001) as assessed by ELISA were significantly higher in nephropathy than control group and correlated with urine albumin concentration (p<0.0001). Plasma prostasin concentration was significantly higher in nephropathy than control group (10.2±0.4 vs. 8.7±0.4 µg/ml, p=0.0114), whereas plasma plasmin(ogen) concentration did not differ. Western blotting supported the presence of urinary plasmin(ogen) and urinary prostasin in nephropathy, but not in control group. uPA activity did not differ between groups (50.2 vs. 42.5 mUnits/µg, 95 % confidence interval (CI): 40.8-61.7 vs. 35.4-50.9 mUnits/µg). Urine from nephropathy patients (n=5) increased inward, amiloride-sensitive current almost fourfold compared to control group (n=5) as evaluated by whole-cell patch clamp on murine single collecting duct cells (62.6±7.8 vs. 16.5±3.9 %, p<0.0001).. Mean 24 h systolic, but not diastolic, blood pressure was significantly higher in nephropathy (144/79 mmHg, 95 % CI: 136.0–151.9/74.9-83.2) than control group (132/75 mmHg, 95 % CI: 126.2-137.4/71.8-77.8, p=0.0117) despite being treated with 3.0±0.4 (nephropathy) vs. 1.4±0.3 (control) antihypertensive drugs including diuretics. Mean 24 h blood pressure correlated significantly with urine plasmin(ogen) concentration (p=0.0102).

Conclusions: Aberrant presence of plasmin activity in urine in diabetic nephropathy is capable of activating ENaC and may contribute to insufficient hypertension control.

PP.42.29 PREVALENCE AND METABOLIC RISK FACTORS OF DIABETES AND PRE-DIABETES IN MALAWI

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Objective: Diabetes is rising globally at an alarming rate but data from sub-Saharan Africa are few. Detailed studies are needed to gain better understanding of this condition and explore local determinants in order to inform health planning and the design of future interventions. This ongoing study aims to investigate the prevalence of diabetes, pre-diabetes and their risk factors among urban and rural Malawian.

Design and method: As part of our non-communicable diseases research programme in urban Lilongwe and in our rural Health and Demographic Surveillance Site in Karonga, we will enrol 40,000 Malawians who are 18 years or older. We report data collected in the first 7 months of the study (N=7,651 adults). A questionnaire on demographic and lifestyle factors was administered by trained interviewers. Anthropometry data were collected using a standard protocol. Plasma glucose and lipid levels were measured after 8-hour overnight fasting. Diabetes and pre-diabetes were defined based on the 2010 American Diabetes Association criteria.

Results: The median (IQR) age was 33 (24-45) years. The overall prevalences

of diabetes and pre-diabetes were 1.9% (95% CI, 1.6% -2.2%) and 4.7% (95% CI, 4.2% -5.2%) respectively. Diabetes prevalence was significantly higher among the urban population (2.5%; 95% CI: 1.9% -3.0%) compared with the rural population (1.5%, 95%CI, 1.1% -1.9%, p=0.02) but pre-diabetes prevalences were similar (5% among urban and 4.6% in rural, p=0.35). The prevalence of diabetes differed by age-group: 0.2%, 1.9% and 9.8% for age groups <30, 30-44 and >=45 years respectively. Neither diabetes nor pre-diabetes prevalences differed between men and women. Central obesity, body mass index elevated levels of total cholesterol, LDL-cholesterol and triglyceride, and lower levels of HDL-cholesterol were all associated significantly with higher risks of both diabetes and pre-diabetes (p<0.01 in each case).

Conclusions: Rates of diabetes and pre-diabetes in Malawi are alarming, especially among urban dwellers, and could have devastating consequences. There is an urgent need to identify effective and sustainable interventions to control and prevent diabetes in Africa.

PP.42.30 RISK FACTORS FOR DEVELOPMENT OF DIABETIC NEPHROPATHY IN CHILDHOOD-ONSET TYPE 1 DIABETES

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Objective: To identify risk factors for its association with any diabetic nephropathy.

Design and method: In this retrospective case-control study we followed 82 diabetic patients (20 with microalbuminuria, 23 with macroalbuminuria and 39 controls – with normoalbuminuria) with childhood-onset type 1 diabetes mellitus (T1DM) and 20 year history of the disease in Moscow district. All patients were matched by age, sex and duration of diabetes. The relation between possible risk factors and development of micro- and macroalbuminuria was analysed with the use of multivariable regression models. Variables included in the model were: age, sex, age at onset of diabetes, duration of diabetes, glycosylated hemoglobin (HbA1c) level, lipids and blood pressure.

Results: In comparison with normoalbuminuric subjects, both micro- and macroalbuminuric diabetic subject had significantly higher levels of diastolic and systolic blood pressure, lipid values and HbA1c. However, when all possible risk factors were tested in a multivariable model, only HbA1c (odds ratio [OR] (95% CI) 3,1 (1,1 – 9,5) (p<0,05)) and triglycerides [OR] (95% CI) 3,0 (1,7 - 5,4) (p<0,01) showed a significant correlation to microalbuminuria. In logistic regression,variables independently related to macroalbuminuria were HbA1c [OR] (95% CI) 4,4 (1,1 – 4,7) (p< 0,05) and systolic blood pressure [OR] (95% CI) 3,4 (1,5 – 7,8) (p<0,01).

Conclusions: In childhood - onset type 1 diabetes after 20 years of diabetes, the only inadequate glycemic control and dyslipidemia are main risk factors of microalbuminuria, whereas poor glycemic control and hypertension are main risk factors of macroalbuminuria

PP.42.31 THE VASCULAR PROFILE OF A HYPERTENSIVE ROMA PATIENT. DATA FROM THE ROMA STUDY

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Objective: To evaluate the vascular profile of the Roma patients with known or newly diagnosed hypertension.

Design and method: Eight hundred and six adult subjects (age range 18-82 years) from two Roma communities of Bucharest were included, between 2012 and 2013, regardless of medical history, and screened for major cardiovascular (CV) risk factors. Further, 271 subjects with hypertension (known and newly diagnosed) were studied (33.6%). We performed routine evaluation of the hypertensive patient as recommended in the ESH guideline. We recorded: demographic and anthropometric data, presence of major CV risk factors and blood pressure measurements with appropriately sized cuffs, presence of left ventricle hypertrophy on echocardiography studies using left ventricle mass index (Devereaux formula), peripheral arterial disease (ankle-brachial index < 0.9 in either limb), increased arterial stiffness (pulse wave velocity >10m/s), microalbuminuria on dipstick and glomerular filtration rate estimated using CKD-EPI study equation. Associated conditions such as diabetes mellitus (known or newly diagnosed), hyperuricemia (>6 mg/dl in females; >6.8 mg/dl in males) were noted. Visceral obesity was defined as waist circumference >102 cm in males and >88 cm in females.

Results: The hypertensive Roma patient displays a vascular profile with an impressive CV burden. There were no statistically significant differences between sexes, except for prevalence of smoking and obesity (BMI, visceral) where women are significantly more affected. For other results see table.

Parameters	Females	Males	Total
Gender, No (%)	172(63.46%)	99(36.53%)	271(100%)
Average age ±SD (years)	56.18±11.32	55.26±10.07	55.84±10.87
Smoking, %	41.28%	54.55%	46.13%
Physical inactivity, %	76.74%	67.68%	73.43%
Visceral obesity, %	81.98%	52.53%	71.22%
Obesity (BMI>30), %	60.47%	21.21%	46.13%
Dyslipidemia, %	45.35%	44.44%	45.02%
Hyperuricemia, %	29.07%	25.25%	27.68%
Diabetes mellitus, %	29.65%	31.31%	30.26%
Pulse wave velocity >10 m/s, %	73.25%	68.68%	73.06%
Peripheral artery disease, %	52.91%	52.53%	52.77%
Left ventricle hypertrophy, %	45.93%	47.47%	46.49%
Chronic Kidney Disease, % eGFR<60ml/min/1.73m2	8.14%	3.03%	6.27%

Conclusions: In a hypertensive population with a very high prevalence of CV risk factors the prevalence of vascular injury is very high. With a prevalence of 50% smokers, 30% diabetics and more than half obese, the population displayed a very high prevalence of peripheral artery disease. Pulse wave velocities as marker of aortic stiffness were significantly increased in over three quarters of patients evaluated.

PP.42.32 PULMONARY HYPERTENSION IN PERITONEAL DIALYSIS AND HEMODIALYSIS PATIENTS

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Objective: Pulmonary hypertension (PH), a disease which carries substantial morbidity and mortality, has been reported to occur in 25%–45% of dialysis patients. To compare the pulmonary artery hypertension (PAH) in hemodialysis (HD) and peritoneal dialysis (PD) patients and its relation with diastolic dysfunction and survival of patients in dialysis therapy).

Design and method: This is an observational study started on January 2011, studied 80 stable HD patients (females 37.5%, mean age 50.36±12.34years) and 45 PD patients (females 40%, mean age 55.07±13 years) on renal replacement therapy (RRT) for more than 3 months. Serum biochemical parameters were collected one month before echocardiography for each patient. The echocardiographic techniques and calculation of different cardiac dimensions and volumes were performed according to the guidelines of the American Society of Echocardiography. Doppler echocardiography were used to determine the pulmonary artery pressure (PAP). PAH was defined as a systolic pulmonary artery pressure (SPAP) >=35 mmHg. Diastolic dysfunction (DD) was evaluated using (E/E') ratio, by tissue Doppler imaging in peritoneal dialysis (PD) and hemodialysis (HD) patients. To rule out secondary PAH, patients with pulmonary disease, collagen vascular disease, and volume overload at the time of echocardiography were excluded.

Results: According to the echocardiographic findings, PAH was found in 26 (32.5%) patients of HD group and in 9 (20%) patients of PD group (p=0.035). It was found a moderated correlation between SPAP and E/E': Spearman correlation coefficient= 0.295, p=0.001. This relationship was found both in HD (Spearman correlation coefficient= 0.315, p=0.005) and in PD group (Spearman correlation coefficient= 0.318, p=0.033). Significant higher value of SPAP was found in patient with CV mortality in comparison with patients alive in therapy: 40.27±9.145 vs 33.29±6.37 (p=0.011).

Conclusions: PAH seems to be more frequent in patients undergoing HD than patients in PD group. Arteriovenous fistula and anemia may have a contribution in it. Echocardiographic findings demonstrate an association between SPAP and diastolic dysfunction in both HD and PD groups. Higher SPAP is associate d with higher mortality.

PP.42.33 THE VALUE OF RENAL VEIN RENIN MEASUREMENT TO PREDICT BLOOD PRESSURE IMPROVEMENT AFTER PERCUTANEOUS REVASCULARISATION AND STENTING FOR RENAL ARTERY STENOSIS

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Objective: The purpose of this study is to evaluate the value of plasma renin activity (PRA)of renal vein to predict blood pressure (BP) response in patients with renal artery stenosis (RAS) after renal angioplasty and stenting.

Design and method: We studied 57 hypertensive patients who were highly suspected of renovascular hypertension (RHV) between 2002 and 2013 in Department of Hypertension at Shanghai Ruijin Hospital. The patients underwent renal artery angiography to make a definitive diagnosis. Before the angiography, the PRA of bilateral renal vein and the infrarenal inferior vena cave were measured. 24h ambulatory BP recordings were obtained before intervention and follow-up.

Results: Thirty-four patients were diagnosed as having RAS, 27 were Uni-RAS and 7 were Bi-RAS. 26 patients underwent PTRA. The remaining 28 had no intervention treatment. None of the different indexes that can be derived from renal vein renin measurements clearly discriminated between the patients who did benefit from intervention, and those who did not.

Conclusions: In conclusion, the value of renal vein renin measurements is limited for deciding whether to revascularize a kidney with renal artery stenosis.

PP.42.34 THE STUDY OF SIDE OF THE GLOMERULAR FILTRATION RATE USED FOR SCREENING INDICATIONS FOR INTERVENTIONAL TREATMENT FOR RENAL ARTERY STENOSIS

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Objective: As the results of a number of large clinical randomized controlled trials have published,the effects and prognosis of interventional treatment for ARAS are becoming controversial. Early diagnosis,correct assessment of renal function and appropriate treatment can reverse and prevent disease progression to some extent.Currently intervention especially percutaneous transluminal renal artery stenting angioplasty (PTRAS) has become the primary means of treatment for ARAS,but it lacks effective methods of screening indications for interventional treatment for ARAS.

Design and method: To evaluate the efficacy of interventional treatment for ARAS by comparing the change of blood pressure,kidney function especially side of glomerular filtration rate measured by renal dynamic imaging (Tm-GFR) and other indicators of ARAS patients before and after interventional treatment and to explore a fundermental renal function which can get the maximum benefit from interventional treatment through statistical analysis to provide a basis for choosing indications for clinical intervention.

Results: Totally 60 patients (36 males,24 females) were divided into unilateral ARAS group (46 cases) and bilateral ARAS group (14 cases) according to the narrow type.Unilateral,bilateral ARAS patients' clinical systolic blood pressure and ambulatory blood pressure were significantly lower than those before intervention,and the number of drugs also decreased significantly ($P<0.01$). Unilateral ARAS patients' serum creatinine,urinary A/C ratio,24-hour urine protein and total Tm-GFR did not change significantly but ipsilateral Tm-GFR was significantly higher after intervention ($P<0.05$),bilateral ARAS patients' serum creatinine,urinary A/C ratio,24-hour urine protein did not change significantly but total Tm-GFR and the lower side of Tm-GFR were significantly increased after intervention.The scatter diagram about ipsilateral Tm-GFR before the intervention and ipsilateral Tm-GFR increased percentage after the intervention showed that the two had a negative correlation($r=-0.6884$,$P<0.0001$). The receiver operating characteristic (ROC) curves about whether Tm-GFR improved or not showed that kidneys whose ipsilateral Tm-GFR<=25ml/min had a great improvement to the maximum extent.

Conclusions: ARAS patients with mild to moderate impaired renal function have a significantly improved blood pressure after interventional therapy,and the ipsilateral kidney whose Tm-GFR<=25ml/min has a significantly improved renal function after interventional therapy.

PP.42.35 OUTCOMES ON PERIPHERAL ARTERIAL DISEASE ON HAEMODIALYSIS. PROGNOSTIC VALUE OF ANKLE-BRACHIAL INDEX

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Objective: Haemodialysis patients have an increased risk of atherosclerotic disease and cardiovascular mortality. There is a strong relationship between chronic kidney disease (CKD) and peripheral arterial disease (PAD). The measurement of ankle-brachial index (ABI) identifies a high prevalence of subjects with asymptomatic PAD. The aim of the study was to analyze the evolution and mortality at one year in patients on haemodialysis according to the presence of PAD.

Design and method: All patients on haemodialysis were included. Patients with a diagnosis of PAD were excluded. ABI measurements were performed using a professional oscillometric BP monitor (Microlife WatchBP Office). The presence of PAD was defined as ABI<1. We take a basal measurement and a control one year later. Demographic and clinical data were recorded.

Results: From 46 patients in our haemodialysis program, 40 were included, 62.5 % men, mean age 68.57 ± 11.58 years. 24 of them (60%) had criteria of PAD: 66% PAD unilateral and 33% bilateral.
Patient´s characteristics: 63 % were hypertensive, 66.7 % diabetics, 61.9 % dyslipemics, 70 % smokers. Mean time on renal replacement therapy and on hemodialysis was:74 and 54 months respectively.
Mortality at one year on PAD group was 32 % vs 20 % in patients without PAD (p = NS) with an attributable risk of 12% and a relative risk reduction of 15%. Mortality was higher in patients with dual antiplatelet therapy respect to single antiplatelet therapy (p = NS). From 46 patients on haemodialysis in 2012, one year later: 16 were died, 1 had clinical PAD, and 2 were lost. Patients who survived (27) keep on and stable control of ABI at one year (medium basal ABI 0.56; control ABI one year later 0.44).

Conclusions: Haemodialysis patients with PAD have an increased mortality annually. Survival is linked to the stable maintenance of ABI. Mortality is higher in patients with dual antiplatelet therapy because of the sum of risk factors that indicate the treatment. We consider the evaluation of ABI in these patients is useful for early diagnosis of PAD and the establishment of strategies to help prevention and treatment.

PP.42.36 STATINS LOWER STENOSIS SEVERITY IN PATIENTS WITH ATHEROSCLEROTIC RENAL ARTERY STENOSIS

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Objective: Atherosclerotic renal artery stenosis (ARAS) patients may benefit from lipid-lowering medications but little is known about the effect on stenosis progression. We sought to examine the effects of medical therapy, including HMg-CoA reductase inhibitors (statins) and ACEI/ARBs on stenosis severity in patients with ARAS.

Design and method: Patients enrolled in CORAL had percent stenosis assessed by visual estimation of lesion angiography. The maximum percent stenosis for any renal artery within an enrolled subject was selected for analysis.

Results: Prior to randomization statins were used in 495 (66%) of patients and ACEI/ARBS were used in 419 (45%). There were 284 diabetics (34%). The overall average percent stenosis at randomization was 76% ± 11. Percent stenosis was significantly lower in patients prescribed statins (75 ± 11 vs. 77 ± 11, p = 0.042) whereas ACEI/ARB use and diabetes did not influence percent stenosis.

Conclusions: Statin use, but not ACEI/ARB, is associated with less severe stenoses in patients with ARAS.

PP.42.37 ANGIOTENSIN INHIBITORS DECREASE ALBUMINURIA IN NON-DIABETIC PATIENTS WITH ATHEROSCLEROTIC RENAL-ARTERY STENOSIS

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Objective: Albuminuria is a marker for the progression of diabetic nephropathy as well as cardiovascular disease and mortality in both diabetics and non-diabetics. Albuminuria in diabetes is commonly treated with angiotensin inhibitors, angiotensin-converting enzyme inhibitors (ACEIs) or angiotensin receptor blockers (ARBs), and treatment with statins may be indicated. Factors that are associated with albuminuria have not been previously examined in patients with atherosclerotic renal-artery stenosis (RAS).

Design and method: The Cardiovascular Outcomes in Renal Atherosclerotic Lesions (CORAL) clinical trial is a prospective, international, multi-center trial of patients with hypertension or chronic kidney disease and renal-artery stenosis (>60%). Urine albumin and creatinine were measured at a single core lab. Microalbuminuria was defined as an albumin creatinine ratio (UACR) ≥30 and ≤300 µg/mg and macroalbuminuria was defined as UACR >300 µg/mg.

Results: At baseline 463 (56%) had a normal UACR, 270 (33%) had microalbuminuria and 93 (11%) had macroalbuminuria. Diabetic patients had higher UACR (376 µg/mg vs. 123 µg/mg, p<0.001). Diabetic patients on an ACEI/ARB had lower UACR (296 µg/mg vs. 465 µg/mg, p=0.164) as did non-diabetics (62 µg/mg vs 176 µg/mg, p=0.009). Non-diabetic patients treated with ACEI/ARBs had a lower rate of microalbuminuria and macroalbuminuria (29.5% vs. 31.6% and 3.9% vs. 10.8%, respectively, p=0.011). In multiple linear regression analysis ACEI/ARBs were negatively associated with albuminuria (p=0.007), while patients with diabetes were positively associated with albuminuria (p<0.001). Statin use was not associated with albuminuria.

Conclusions: In patients with atherosclerotic renal-artery stenosis angiotensin inhibitors decrease albuminuria in both diabetics and non-diabetics, whereas statins do not.

PP.42.38 INTEREST OF SYSTEMATIC SCREENING OF MASKED HYPERTENSION IN PATIENTS WITH PERIPHERAL ARTERIAL DISEASE USING AMBULATORY BLOOD PRESSURE MONITORING

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Objective: Masked hypertension (MH) is defined by a normal office blood pressure (BP) and a high ambulatory BP. MH emerges as a critical public health concern due to its significant prevalence (10 to 25 %) and its poor cardiovascular prognosis.
The aim of this study is to evaluate the interest of a systematic MH screening, using twenty-four-hour ambulatory blood pressure monitoring (ABPM), among patients with peripheral arterial disease.

Design and method: Between June 2011 and August 2013, 54 patients with peripheral arterial disease who came in consultation or were hospitalized in the Vascular Medicine and Hypertension unit of the University Hospital of Lille, were included. They had a normal office BP (< 140/90 mmHg). An ABPM device was set on each patient. MH diagnosis was established if the BP average over 24 hours was higher than 130/80 mmHg, the daytime average higher than 135/85 mmHg or the night-time average higher than 120/70 mmHg.

Results: MH prevalence is about 42.6 % (23 patients). It is significantly more important in diabetic patients (64.7 % versus 32.4 % in non diabetic patients ; p = 0.026), in patients with known hypertension (58.1 % versus 21.7 % in patients without known hypertension ; p = 0.006) or with high-normal office BP (BP < 140/90 but systolic blood pressure > 130 mmHg or diastolic blood pressure > 85 mmHg) (64 % versus 24.1 % in case of strictly normal BP ; p = 0,003).

n = 54	Absence of masked Hypertension n = 31	Masked hypertension n = 23	p
Age (years/- DS)	62.7 +/-12	58.6 % +/- 9	0.241
Men (n ; %)	28 (90.3 %)	18 (78.2 %)	0.264
Tobacco (n ; %)	23 (74.2 %)	14 (60.9 %)	0.297
Dyslipemia (n ; %)	25 (80.6 %)	19 (82.6 %)	0.272
Diabetes mellitus (n ; %)	6 (19.5 %)	11 (47.8%)	***0.026***
Known Hypertension (n ; %)	13 (41.9 %)	18 (78.3 %)	***0.008***
Abdominal obesity (n ; %)	14 (45.2 %)	13 (56.5%)	0.407
Cardiovascular heredity (n ; %)	2 (6.5 %)	5 (21.7 %)	0.088
Sleep apnea syndrome (n ; %)	0 (0 %)	1 (4.3 %)	0.426
High-normal blood pressure (n ; %)	9 (29.0 %)	16 (69.5 %)	***0.003***

Conclusions: The high prevalence of MH in patients with peripheral arterial disease shows us the importance of a careful screening, specifically in diabetic patients, in patients with known hypertension or with a high-normal office BP.

POSTERS' SESSION

POSTERS' SESSION PS43
LIFESTYLE CHANGES

PP.43.01 CROATIAN REGISTRY ON AMBULATORY BLOOD PRESSURE MONITORING (HRKMAT). PRELIMINARY REPORT ON MEDICAL HISTORY AND LIFESTYLE CHARACTERISTICS OF STUDY POPULATION

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Objective: To analyse life style characteristics of the subjects included in the Croatian national registry on ambulatory blood pressure monitoring (ABPM).

Design and method: Out of 1637 hypertensive subjects included so far in the national registry, data on 1399 participants (men 55%; median age 59) were analysed. Family history on hypertension, cardiovascular diseases (CVD), diabetes, dyslipidaemia and renal disease was assessed. Data on subjects' comorbidities including TIA, stroke, coronary heart disease (CHD), heart failure (HF), peripheral arterial disease (PAD), chronic kidney disease (CKD), retinopathy, diabetes, glucose intolerance and dyslipidaemia were assessed. Patients reported their habits: smoking, alcohol and coffee consumption and physical activity. Office and ABPM were measured during normal working day.

Results: Family history was positive for hypertension in74.7%, for CVD in 55.7%, for diabetes in 34.7%, for dyslipidaemia in 31.7% and for renal disease in 13.9% of participants. Patients' comorbidities were TIA (5.9%), stroke (4.6%), CHD (15.3%), HF (4.8%), PAD (7.0%), CKD (14.9%), retinopathy (2.8%), diabetes (22.8%), glucose intolerance (9.2%) and dyslipidaemia (54.1%). There were 17% current smokers (82% smoking 1-10 cigarettes per day), 15% ex-smokers, while 66% never smoked. Drinking alcohol reported 12% of subjects, while 57% were consuming coffee (48% 1 cup/day, 37% 2cups/day, 15% three of more cups/day). Low level of physical activity admitted 43.8%, modest 42% and vigouros14.1% of participants.

Conclusions: According to our results hypertensive subjects have family burden of hypertension and other risk factors. Patients from our registry frequently have other comorbidities, dyslipidaemia, diabetes and CKD being most prevalent. We found surprisingly(and luckily) small number of smokers but high intake of coffee. Disturbingly high amount of participants are poorly physically active.

PP.43.02 FAILURE OF ACHIEVEMENT OF THE CHOLESTEROL GOAL BY HYPERTENSIVE PATIENTS

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Objective: Implementation of numerous guidelines remains a daunting goal for cardiologists. We assessed the hypothesis that the majority of treated hypertensives with elevated serum cholesterol levels, do not achieve the goals for Total Cholesterol (TC) and serum Low Density Lipoprotein Cholesterol (LDL-C).

Design and method: We conducted a cohort study with retrospective chart review, at the electronic medical record of our outpatient antihypertensive unit. Total of 210 treated hypertensive adults (aged=57±11 years, 55%=male), naive to previous lipid therapy with raised lipid levels and/or SCORE-risk>5% (using the low risk chart of the Fourth Joint Task Force), were included in the analysis from October 2007 to December 2008 (index time). Laboratory values of lipid panel were obtained right before and after the initiation of lipid pharmacotherapy, accompanied by verbal and written guidance for lifestyle modification.

Results: Mean monitoring duration time was 12 months. Average levels of TC and LDL-C were found 235 mg/dl and 170 mg/dl respectively. The majority of patients (92%) received monotherapy with HMG-CoA reductase (statin). Within index time, 46% (97/210) attained optimal combined cholesterol values. The remaining 54% (113/210) of the total population did not reach the cholesterol goal; among them 68% (77/113) was due to stringent target (established Cardio-Vascular Disease, Diabetes Mellitus, markedly increased lipid levels); another 20% (23/113) was due to inadequate therapy (low equipotency or low dose of statin) for the raised cholesterol values; an 8% (9/113) quit treatment for personal beliefs and 4% (5/113) were intolerant.

Conclusions: Achieving optimal cholesterol goals among hypertensives is amenable to both scientific analysis and clinical intervention but remains an odyssey. Renewed research and communication efforts must impart greater hope, confidence and increased access to treatment.

PP.43.03 LIFESTYLE RELATED CARDIOVASCULAR RISK FACTORS OF THE HYPERTENSIVE ROMA PATIENT. WHERE AND WHEN TO ACT. DATA FROM THE ROMA STUDY

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Objective: To evaluate lifestyle related cardiovascular (CV) risk factors in the hypertensive Roma population, information that further guides national strategies to improve health and outcome of this ethnic minority.

Design and method: 806 adult subjects (age range 18-82 years) from two Roma communities of Bucharest were included, between 2012 and 2013, regardless of medical history, and screened for major CV risk factors. Further, 271 subjects with hypertension (known and newly diagnosed) were studied (33.6%). We recorded: demographic and anthropometric data, level of education, living conditions, health related expenses, presence of major CV risk factors and blood pressure measurements with appropriately sized cuffs and asymptomatic target organ damage. Compliance to treatment and to diet recommendations were also noted along with associated conditions such as diabetes mellitus (known or newly diagnosed – glycaemia >126 mg/dl), hyperuricemia (>6 mg/dl in females; >6.8 mg/dl in males), dyslipidemia (LDL>115 mg/dl or total cholesterol>190 or triglycerides>150mg/dl). Visceral obesity was defined as waist circumference >102 cm in males and >88 cm in females.

Results: The prevalence of HTN was lower than that of the general population in Romania (33.6% vs 40.5% in the SEPHAR II Study, p<0.01). However, the Roma hypertensive patient displays a profile with an impressive CV burden. For other results see table.

Parameters	Females	Males	p (F vs M)	Total
Gender, No (%)	172(63.46)	99(36.53%)	<0.01	271(100%)
Average age ±SD (years)	56.18±11.32	55.26±10.07	ns	55.84±10.87
Level of education ±SD (no of years in school)	7.8±3.62	9.09±2.89	0.01	8.43±3.34
Living alone, widowed	26.74%	12.12%	<0.01	21.4%
Unemployed	48.83%	36.36%	0.04	44.28%
Not registered at a family physician	11.62%	22.22%	0.02	15.49%
Smoking, %	41.28%	54.55%	0.03	46.13%
Physical inactivity, %	76.74%	67.68%	ns	73.43%
High sodium intake, %	9.88%	14.14%	ns	11.44%
Visceral obesity, %	81.98%	52.53%	<0.01	71.22%
Obesity (BMI>30), %	60.47%	21.21%	<0.01	46.13%
Weight variations >5kg past year, %	60.47%	48.48%	ns	56.09%
Dyslipidemia, %	45.35%	44.44%	ns	45.02%
Hyperuricemia, %	29.07%	25.25%	ns	27.68%
Compliance to diet recommendation, %	15.69%	16.16%	ns	15.86%
Compliance to drug treatment, %	25.58%	25.25%	ns	25.46%

Conclusions: In a population with a very low level of education, poor access to medical services, women have a higher prevalence of modifiable CV risk factors. They are less educated and have a higher rate of unemployment. However, they are more likely to register for medical services, and there is a significant difference between widowhood between the two sexes. Roma hypertensive women are significantly much more affected by obesity. Compliance to diet recommendation is very low and only a quarter of these patients follow medical treatment on a daily basis.

PP.43.04 SIX YEARS SURVEY OF 24-HOUR SALT INTAKE ESTIMATED BY SPOT URINE IN THE JAPANESE GENERAL POPULATION

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Objective: Excess dietary salt intake is one of the major risk factor of hypertension. Moreover, accumulating evidence supports independent correlations between excess dietary salt intake and cardiovascular diseases including coronary artery disease and stroke. The present study was designed to investigate a comprehensive overview of salt intakes in the Japanese general population in order to provide basic information for public health to reduce salt intakes.

Design and method: A total of 43,566 participants (men=27,947, mean age=56.4 years), who visited our hospital for a yearly physical checkup from July 2008 to December 2013, were enrolled. Individual salt intake was estimated by calculating 24-hour urinary salt excretion using a method previously reported. Hypertension was defined as systolic blood pressure >=140mmHg, diastolic blood pressure >=90mmHg, or the use of antihypertensive medications.

Results: The mean salt intake was 11.0±3.4g/day in the year 2013 and was higher in men (12.4±3.2g/day) than in women (8.4±2.2g/day). These values were not changed during the past 6 years. Among all subjects, 13,654 subjects were defined as hypertension. During the past 6 years, the prevalence of hypertension was gradually increased (from 29.8% to 32.3%) and the ratio of hypertensive subjects under antihypertensive treatment to all hypertensive subjects was significantly increased (from 60.6% to 74.2%). In both men and women, estimated salt intakes were increased across the blood pressure categories (optimal, normal, high normal, and hypertension), but salt intakes were not different in hypertensive subjects with and without antihypertensive medication (13.1±3.5g/day and 13.1±3.1g/day, respectively, in men; 9.0±2.4g/day and 9.2±2.3g/day, respectively, in women). Only a small number of hypertensive subjects (overall 2.9%, men 0.6%, women 8.4%) achieved the target salt intake recommended by most guidelines for the management of hypertension (6 g/day).

Conclusions: Unfavourable high salt intakes in the Japanese general population were revealed, indicating that effort to reduce dietary salt consumption was not very successful in Japan during the past few years. The present results provide the basic information to reduce salt intakes and related cardiovascular mortality and morbidity.

PP.43.05 DECREASE OF BLOOD PRESSURE MAY BE ESSENTIAL FOR IMPROVEMENT OF VASCULAR DAMAGE IN MIDDLE-AGED HABITUAL SMOKERS

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Objective: Cigarette smoking is one of the major risk factors of cardiovascular disease. The serious risk may be attributable to premature or accelerated development of vascular endothelial damage and atherosclerosis caused by smoking. Among numerous toxic molecules included in cigarette smoke, nicotine is a major substance underlying the smoking addictions and directly affects cardiovascular system. The purpose of this study was to examine effects of instructions to stop smoking on the vascular endothelial function in subjects with habitual cigarette smoking.

Design and method: Middle-aged male habitual smokers (42±10 years, n=30) were enrolled and instructed to stop smoking. Clinical profiles and laboratory findings including serum levels of cotinine, a principal metabolite of nicotine, were investigated at baseline and 8 weeks after the instruction. Vascular endothelial function was assessed by investigating reactive hyperemia of small arteries using peripheral arterial tonometry (RH-PAT; End-PAT 2000) in the morning under an overnight fasting condition and was expressed as a RH-PAT index.

Results: At baseline, endothelial function expressed as a RH-PAT index was inversely correlated with serum levels of cotinine (r=-0.48, P<0.01), LDL cholesterol (r=-0.42, P<0.05), and chylomicron (r=-0.52, P<0.01). More than half of the smokers (n=17) could not completely attain smoking cessation and, thus, the RH-PAT index was not significantly improved 8 weeks after the instruction of smoking cessation. However, changes in the RH-PAT index showed a significant correlation with those in systolic blood pressure (r=-0.54, P<0.01). Moreover, the RH-PAT index was significantly increased in subjects who showed a decrease in systolic blood pressure (1.83±0.29 to 2.24±0.56, P<0.05).

Conclusions: Vascular endothelial function assessed by End-PAT 2000 was improved 8 weeks after the instruction of smoking cessation only in subjects who showed a blood pressure reduction during the study period. This suggests that a decrease in blood pressure is a key process to achieve an improvement of vascular endothelial function from smoking-related vascular damage.

PP.43.06 THE ASSOCIATION OF PHYSICAL ACTIVITY WITH THE STRUCTURE AND FUNCTION OF LEFT VENTRICLE IN A GENERAL POPULATION

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Objective: Physical activity (PA) is one of the major components of lifestyle therapy for patients with cardiovascular diseases as well as for the general population. Beneficial effects of physical activity on the cardiovascular systems is well documented but the precise mechanisms related to the hemodynamics or left ventricular (LV) structure or function in a population level are mixed.

Design and method: In the rural area, Yangpyung, Gyunggi Province in South Korea, for 1515 subjects, echocardiography, brachial ankle pulse wave velocity and questionnaire for physical activity were performed. Echocardiographic LV mass in gram/height², diastolic function parameters such as E, E/A, DT, IVRT were measured. Modified Stanford 7 day recall questionnaire to reflect the difference in the PA between field working seasons and the other seasons was applied to measure metabolic equivalent (METs) per day. In multiple regression model for LV mass index included age, sex, BMI, waist circumference, systolic blood pressure, pulse, total cholesterol, HDL, triglyceride, fasting blood glucose, antihypertensive medication (AHM), and eGFR. And for LV function, LV mass index was additionally added.

Results: The age was 60.6 +/- 10.1 years and female was 59.8% (n=906). Hypertension was observed in 43.1% (n=653). Subjects taking antihypertensive medication was 28.4% (n=431). In multiple regression analysis, for hypertension subjects, daily METs was positively associated with LV mass index (β=0.00096181, p=0.0572), E (β=0.00187, p=0.0085), E/A (β=0.00002087, 0.0492) and negatively associated with DT (β= -0.0033, p=0.0265), IVRT (β= -0.00165, p=0.004) and bapwv (β= -0.03788, p=0.003). There was no association with relative wall thickness. In normotensive subjects, daily METs had negatively associated with E (β= -0.00121, p=0.0527) and E/A (β= -0.00002307, 0.0198) and positively associated with RWT (β=0.296x10-5, p= 0.1306). Findings observed in hypertension subjects were also noted in the subjects taking AHM.

Conclusions: Even though physical activity have marginally positively associated with LV mass index, it might have beneficial effects on LV diastolic function and arterial stiffness without altering LV geometry, especially in hypertensive subjects regardless of antihypertensive medication status. Physical activity should be emphasized in all hypertension patients. For normotensive subjects, larger scale study is needed.

PP.43.07 EVALUATION OF HYPERTENSIVE PATIENTS INSIDE A BRAZILIAN DISEASE MANAGEMENT PROGRAM

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Objective: To analyse a group of hypertensive patients followed on a nurse-led disease management program from the beginning in this program through fifteen months of participation.

Design and method: Retrospective Cohort Study with quantitative approach of 283 hypertensive patients (73,4±10,9 years; 62,5% women) assisted in a disease management program conducted by telephonic contact with nurses between January 2011 to May 2012. The fifteen months follow up was segmented into five blocks of 3 months each. A comparison between the first quarter and the last quarter of participation was made with the following variables: Blood Pressure values, Body Mass Index, Sedentary, Use of Tobacco, Alcohol Intake and Medication Adherence measured by Morisky and Green survey. CI was 95% and the statistical significance level used was p<0,05.

Results: The association was statistical significance (p<0,05) between the comparisons in the first quarter versus the last quarter related to the following variables: Systolic Blood Pressure (128,8 vs 125,1 mmHg); Diastolic Blood Pressure (78,9 vs 77,2 mmHg) Sedentary (96,8% vs 71,7%); Medication Adherence (25,1% vs 85,5%) and Alcohol Intake (10,2% vs 3,2%). For the other variables Body Mass Index (27, 7 vs 27, 6 kg/m2) and Use of Tobacco (3,5% vs 5,7%) p>0,05.

Conclusions: The hypertensive patients assisted by the disease management program show that this kind of approach helps controlling the main associated factors for worsen the condition such as sedentary and alcohol intake while significantly increased the medication adherence which has a positive impact on their treatment.

PP.43.08 DEPRESSION AND LIFESTYLE RISK FACTORS IN NON DIABETIC HYPERTENSIVE PATIENTS

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Objective: To investigate association between psychosocial factor as depression and unhealthy lifestyle in non diabetic hypertensive patients (pts).

Design and method: In this study we include 184 hypertensives (92 men, 92 women), which underwent to physical examination and depression screening through Center for Epidemiologic Studies Depression (CES-D) scale. The lifeslyle risk factors also were analyzed: smoking, alcohol consumption, physical activity. Alcohol consumption was graded by frequency in 3 ranges: nondrinkers, 1-3 standard drinks a month, 1-6 standard drinks a week. The levels of physical activity during more than 40 minutes were divided in 4 categories: very seldom, less than once a week, 1-3 times a week, more than 3 times a week. Exclusion criteria were no prior evidence of coronary heart disease, diabetes mellitus and body mass index (BMI) >40 kg/m2.

Results: Mean age of hypertensive pts was 48.1±11.9 years, average office systolic/diastolic blood pressure (BP) were 140.8±20.1/89.3±12.6 mmHg,14% smokers. According the CES-D questionnaire all pts divided in two groups: 1 – 75 pts (41%) without depression (<15 points) and 2 – 109 pts (59%) with mild to major depression (>=15 points). The pts in the second group were significance older than pts in first group (50.7±11.7 vs 44.2±11.9 years,p<0.01) and the prevalence of depression was higher in women than in men (58.7% in 2 group vs 37.3% in 1 group,p<0.01). These groups did not differ by BP levels, BMI, alcohol consumption and level of physical activity. In the multiple regression analysis (F=8.79, p<0.01) of the relationship depression and clinical, lifestyle risk data in pts was found that independent factors of depression were age (β =0.21), grade of hypertension. (β=0.16), female gender (β=0.15) and waist circumference (β = -0.14).

Conclusions: This study demonstrated the high prevalence of depression in non diabetic hypertensive pts. The lifeslyle risk factors as smoking, alcohol consumption, physical activity were not associated with depressive symptoms in uncomplicated arterial hypertension. The findings revealed increasing depression with age, severity of hypertension and female gender what may confirm possible related pathogenetic mechanisms between depression and hypertension, what required early psychological intervention in hypertensive pts.

PP.43.09 PREDICTORS OF SPONTANEOUS BLOOD PRESSURE DECLINE IN STAGE 1 HYPERTENSION

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Objective: BP steadily increases with aging. However, lifestyle and environmental factors can modify the longitudinal BP tracking over the life. In the HARVEST study, 19.5% of the participants showed a BP decline to normal during a median follow-up of 16.5 years (Normotensives). The aim of this study was to identify the determinants and the predictors of the BP decline in these subjects.

Design and method: This investigation was conducted in 1019 subjects with initial stage 1 hypertension (mean of 6 readings) who remained untreated for at least 3 months and had complete follow-up data (mean age 339 years, 277 females). Patients were seen periodically and were given non-pharmacological recommendations. Antihypertensive treatment was started if they met the criteria for drug treatment (Hypertensives, n=820).

Results: Normotensives (n=199) were leaner (p=0.02), more physically active (0.02), drank less coffee (p=0.03), had lower triglycerides (p=0.04) and higher HDL-cholesterol (p=0.04) than Hypertensives. In the Normotensives, most of the BP decline occurred within the first year (from 14610/926 to 13811/878 mmHg). Thereafter, BP further declined to 1338/865 mmHg at follow-up end. The follow-up decline of heart rate was 610 bpm in Normotensives and 211 bpm in Hypertensives (p<0.001). White-coat hypertension at baseline was more common among Normotensives (32% versus 19%, p<0.001). However, in a sex-and-age-adjusted logistic regression both clinic BP decline after 3 months (p<0.001) and white-coat hypertension (<0.001) were predictive of future normotension. An improvement in lifestyle factors (p=0.001 for alcohol, p=0.04 for coffee), and a smaller yearly increase in body weight (p=0.002) were observed in Normotensives compared to Hypertensives. At follow-up end, prediabetes was less frequent in Normotensives than Hypertensives (17% versus 28%, p=0.002). None of the Normotensives developed cardiovascular events or atrial fibrillation (p<0.001 and p=0.07, respectively, versus Hypertensives).

Conclusions: In a substantial portion of young-to-middle-age stage 1 hypertensives antihypertensive treatment can be deferred because of a spontaneous long-lasting decline of clinic BP. This is more common in subjects with better metabolic profile who adopt healthier lifestyles. White-coat hypertension, an initial clinic BP drop, and a decrease in heart rate are predictors of this favourable outcome.

PP.43.10 SELF REPORTED PHYSICAL ACTIVITY IN HYPERTENSIVE PATIENTS AT THE MEDICAL OUT-PATIENT DEPARTMENT UNIVERSITY OF BENIN TEACHING HOSPITAL, BENIN-CITY, NIGERIA

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Objective: The importance of regular physical activity in the control of hypertension has been emphasized in various guidelines. This recommendation is usually suggested to the patients during routine clinic attendance. However in this setting, the different types of physical activities being undertaken at home are not well documented.
To assess the types of physical activity being undertaken by hypertensive patients attending the medical out-patient department of the University of Benin Teaching Hospital.

Design and method: This was a cross-sectional descriptive study utilising patients' self report of the different types of physical activities undertaken at home. A semi-structured researcher administered questionnaire was used. The demographics, types, frequency and duration of physical activity were documented. The blood pressure was also measured and good control were assessed in conformity with the 1999 WHO/ISH guidelines.

Results: A total of 509 patients were recruited into the study (age range of 22-97years; M:F- 1:2.2). Two hundred and fifty-nine patients (50.9%) volunteered they undertook some form of physical activity. This was mainly described as brisk-walking 179(69.1%), jogging 27(10.4%), workouts in gymnasium 13(5.1%), dancing 4(1.5), cycling 4(1.5%) and weight lifting 1(0.4%). Physical activities in a further thirty one (11.9%) patients related to home chores and farming. In most patients the frequency of exercise ranged from 2-3 times weekly to daily in 179 (69.1%) and once a week in 30(11.6%), and infrequently in 19(7.3%). The time reportedly spent in exercising ranged from 5 to 180 minutes. A total of 177(34.8%) patients had controlled blood pressure. There was a trend to a better control in those who partook in some physical activity (¬98 (55.4%), ¬vs 79 (44.6%)). This did not achieve statistical significance.

Conclusions: This study shows that just one half of the patients partook in some form of physical activity. There is need to engage hypertensive patients on the relevance of physical activity and encourage them to obtain the known benefits by optimizing their levels of physical activity.

PP.43.11 NUTRACEUTICALS FOR BLOOD PRESSURE AND SERUM LIPIDS CONTROL IN SUBJECTS WITH GRADE 1 HYPERTENSION

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Objective: As suggested in the 2013 ESH/ESC arterial hypertension guidelines the evidence favouring anti-hypertensive drug treatment in subjects with grade-1 hypertension is scant because no trial has specifically addressed this condition. In addition, the risk of potential side effects due to the antihypertensive agents whenever started could overcome the possible benefit of blood pressure (BP) improvement. Nutraceuticals - in light of their properties - are free from relevant side effects and could be a possible strategy for

the treatment of these subjects. The aim of this study was to evaluate the efficacy of the nutraceuticals in lowering BP and improving lipid profile.

Design and method: Sixty-six patients with grade 1 essential hypertension (36 males and 30 females, mean age 56.0±4.6 years) without history of cardiovascular diseases and organ damage consecutively referred to our hypertension centre were analysed. The nutraceutical ARMOLIPID PLUS was started one tablet once-daily for 6 months. Clinic BP and 24-hours ambulatory BP monitoring (24h-ABPM) values and serum total cholesterol (TC), LDL-cholesterol (LDL-C), HDL-colesterol (HDL-C) and serum triglycerides (TG) were evaluated at baseline before treatment and at the end of the follow-up. Analysis of variance for repeated measures for BP and serum lipids values was provided.

Results: A significant reduction of mean 24h-systolic ABPM (141.6±6.4 vs. 136.2±4.8 mmHg $p<0.05$) and mean 24h-pulse pressure (52.6±7.2 vs. 47.3±5.4 mmHg) values compared with baseline was found. On the contrary, no reduction for clinic BP was observed. A significant (all $p<0.001$) improvement of the lipid profile was found and TC reduced by -19,2%, LDL-C by -17,4% and TG by -16,3%; HDL-C remained unchanged. No significant difference in BP reduction and in the improvement of lipid profile was found between genders.
Two patients dropped out from the study because of side effects (1 for a doubling in CPK levels and 1 for dyspepsia).

Conclusions: In grade-1 hypertensive subjects, nutraceuticals were safe and well tolerated and effective in reducing 24-hour BP levels and in improving lipid pattern. Randomised trials are needed to confirm and to answer any questions on these findings.

PP.43.12 LIFESTYLE AND CONTROL OF CARDIOVASCULAR RISK FACTORS IN ELDERLY OUTPATIENTS

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Objective: The relationship between lifestyle and cardiometabolic risk profile is well known in the adult population, whilst less information is available about the influence of patients' habits on the effects of treatment of cardiovascular risk factors (CVRFs) in the elderly. The present longitudinal intervention study aimed at investigating the interaction between lifestyle and pharmacological treatment in 406 patients (306 F) over 60 years of age, attending 2 public Outpatient Clinics of Naples for hypertension and metabolic abnormalities.

Design and method: Patients were followed-up by the same physician for a period up to 183 months (M±SD =23±35, median=6.1). Lifestyle was assessed by a structured questionnaire.

Results: A significant reduction in body weight, blood pressure, and glucose, cholesterol, and triglyceride levels was obtained. Smoking habit was present in 14% of women and 16% of men (χ^2 n.s.). Change in diastolic blood pressure (DBP) was greater in non-smokers as compared to smokers: -7±11 mmHg vs -4±11 mmHg, $p<0.004$. No between-group differences in changes of the other above-mentioned parameters were observed.
Thirty-six% of women and 71% of men drank small or moderate amounts of alcoholic beverages (χ^2 significance <0.001). Among women, drinkers showed an increase in serum uric acid during the follow-up (+0.55±1.3 mg/dL), unlike non-drinkers (-0.03±1.3 mg/dL, $p<0.05$). Conversely, SBP reduction was greater in alcohol-consumer men (-12±25 mmHg) than in non-consumers (-2±16 mmHg, $p<0.03$). Sedentary habit was evenly present in the 2 genders (45%F, 40%M, χ^2 n.s). Physically active patients showed a greater decrease in DBP (-8±11 mmHg) as compared to the sedentary ones (-5±11 mmHg, $p<0.02$). Total cholesterol was also reduced at a greater extent in active patients, but the difference attained the statistical significance in men only (-36±31 vs -5.5±47 mg/dL, $p<0.011$). The figure in the whole population was -30±40 vs -19±47 mg/dL, $p=0.068$.
Two separate multiple regression analyses showed the independent association of DBP changes with smoking habit and physical activity in models including baseline DBP and follow-up duration, but not age, gender, and education level.

Conclusions: These data show that a correct lifestyle strongly potentiates the efficacy of CV risk factor treatment in elderly outpatients.

PP.43.13 BLOOD PRESSURE CONTROL AND COST-EFFECTIVENESS OF SALT CONSUMPTION REDUCTION AND REGULAR PHYSICAL TRAINING IN PATIENTS AFTER BYPASS SURGERY

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Objective: The benefits salt consumption reduction and physical training have been identified. Clinical data of long-term cardiac rehabilitation program with salt consumption reduction and regular physical training and cost-effectiveness requires analysis.

Design and method: 200 patients (18% female, middle age – 57.7 years old,) undergoing bypass surgery (CABG) were included into 2-year rehabilitation program with cardiologist supervision, dietarian consultations, controlled exercise training (every 6 month) and self-controlled exercise training (daily morning exercise and walking with pulsimeter control). Patients were randomized in 2 groups: I group (46%) rehabilitation participants and II group – «standard-care».

Results: Mean systolic blood pressure was 30 mmHg lower in group I than II 24 month after CABG, $p<0,01$(130-128-121-115 mmHg in I group against 130-132-140-145 mmHg in II group 6, 12, 18, 24 month after CABG). Mean diastolic blood pressure was 16 mmHg lower in group I than II 24 month after CABG, $p<0,05$ (83-73-73-73 mmHg in group I against 86-89-90-89 mmHg in group II 6, 12, 18, 24 month after CABG). Target blood pressure was achieved 1,5-times fold much in I group patients, $p<0,001$ and mean myocardial mass index on echocardiography was 18,1 g/m2 was lower in I group patients by the end of 2nd year with no statistically significant difference 1 month after CABG. Mean average number of antihypertensive drugs was 1,5-times fold less in I group than into II, $p<0,05$. Thereat drugs therapy cost was 1,6-times fold less in 1st years ($p=0,006$) and 1,8-times fold ($p=0,004$) – in 2nd year in I group patient than II. Cost minimization in case of cardiac rehabilitation program participation was 1232,9 dollars per 1 persons for 2 years.

Conclusions: 2-years cardiac rehabilitation program with dietary consultation, salt consumption reduction and regular physical training in patients after CABG is a cost-effective, evidence based approach on improving systolic/diastolic blood pressure and myocardial mass index control, cost saving – 1,7-times fold reduced drug therapy cost for 2 years.

PP.43.14 ROLE OF NUTRACEUTICALS FOR THE TREATMENT OF HYPERCHOLESTEROLEMIA IN HYPERTENSIVE SUBJECTS AT LOW CARDIOVASCULAR RISK

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Objective: High serum cholesterol is a common risk factor in the Italian population and its active control is a crucial goal in order to implement an effective prevention of the cardiovascular events, particularly in subjects with high cardiovascular risk (CVR). On the contrary in subjects at low CVR the reduction of cholesterol levels by cholesterol-lowering drugs is not the recommended as first-line strategy and in these subjects ESC/EAS guidelines suggest - in addition to the change of lifestyle - the use of nutraceuticals and functional foods. The aim of this study was to evaluate the change in serum total cholesterol (TC), low-density lipoproteins cholesterol (LDL-C), triglycerides (TG) and high-density lipoproteins cholesterol (HDL-C) in hypertensive subjects which did not require the treatment with cholesterol-lowering drugs.

Design and method: In a group (A) of one-hundred two dyslipidemic hypertensive subjects (54 men and 48 women, mean age 52 ±2.8 years) serum blood lipids (in mg/dl) levels were assessed; TC was 230±24, TG 130±30, HDL-C 40 ± 5 and LDL-C 130 ± 10 respectively, without differences between genders. In these subjects ARMOLIPID PLUS one tablet daily, was started for 3 months and were compared with a other group (B) of dyslpidemic subjects age and sex matched which followed a diet program.

Results: In the group A, there was a significant reduction of TC (-24%), TG (-20%), LDL-C (- 23%) and an increase in HDL-C (+9%). In the group B, a smaller reduction of TC (-15%), TG (-12%), LDL-C (-10%) and in the increase of HDL-C (+4%) was observed.

Conclusions: In hypertensive subjects at low cardiovascular risk, nutraceuticals seems to be an effective approach in improving serum lipids pattern and in bridging the gap between the effectiveness of diet and the active treatment with cholesterol-lowering drugs.

PP.43.15 LOW RISK LIFESTYLE AND ARTERIAL STIFFNESS: THE HYPERTENSION-DIABETES DAEGU INITIATIVE STUDY

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Objective: Unhealthy lifestyle habits may contribute to arterial stiffness [brachial-ankle pulse wave velocity (baPWV)]. The aim of this study is to investi-

gate the associations of smoking, drinking, physical activity, and diet with arterial stiffness.

Design and method: Study subjects were 1,474 Koreans in a rural area in Daegu city. They were enrolled from August to November 2008 for a cohort study. Of these subjects, 1,400 eligible subjects (519 men; mean age = 63.3 ± 10.6 years-old) were finally analyzed in this study. The baPWV was measured in the supine position after 5 min of bed rest using an automatic waveform analyzer (Colin VP-1000). A lifestyle score ranging from 0 to 4 was calculated using smoking status, drinking status, physical activity, and diet. A score of 1 awarded for each healthy behavior. Patients were divided into 4 groups according to a lifestyle score; 0 (n=207, 14.8%), 1 (n=291, 20.8%), 2 (n=519, 37.1%), and 3-4 (n=383, 27.4%).

Results: Of these subjects, only 73 (5.2%) satisfied all 4 healthy lifestyle criteria. The mean baPWV was significantly lower in subjects with higher lifestyle score (1707.4 ± 420.0cm/s versus 1675.9±418.1cm/s versus 1634.7±357.8cm/s versus 1571.9±331.0cm/s, p for trend <0.001). In analysis of covariance, subjects with a lifestyle score of 3-4 had a significantly lower mean baPWV compared to a subjects with a lifestyle score of 0, 1, and 2 after adjusting for conventional risk factors (model 1; p=0.048), inflammatory markers including high-sensitivity C-reactive protein and uric acid (model 2; p=0.046), and ankle-brachial index (model 3; p=0.035). In multivariate linear regression analysis, baPWV decreased by 0.104 cm/s (p = 0.005) in the subjects with 3 or 4 low-risk lifestyle habits compared to the subjects without low-risk lifestyle habits after adjusting for conventional risk factors, inflammatory markers including high-sensitivity C-reactive protein and uric acid, and ankle-brachial index.

Conclusions: Arterial stiffness is independently associated with lifestyle score in the general population. Our finding suggests that combination of healthy lifestyle such as regular exercise, healthy diet, smoking cessation, and drinking avoidance is modestly associated with lower arterial stiffness.

PP.43.16 CIRCADIAN AMBULATORY MONITORING OF TEMPERATURE, ACTIVITIES AND POSITION IN MENOPAUSAL WOMEN WITH OR WITHOUT HOT FLASHES

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Objective: Analyse differences if there exist in circadian rhythm of peripheral temperature, activity and position among menopausal women with more than three episodes of hot flashes per day compared to those that occur less frequently.

Design and method: An observational, descriptive study was carried out on 33 postmenopausal women aged 50 to 55 years divided into two groups: a) positive flashes hot flashes + (n = 17) menopausal women who present hot flash frequency 3 or > 3 flushes / day. B) negative flashes hot flashes - (n = 16) postmenopausal women without hot flashes or episodes that occur with a minor frequency to 3 hot flashes / day. Each woman included was studied for a week in which they were completing a sleep diary. Temperature rhythms wrist and motor activity were recorded simultaneously.

Results: Both the hot flashes group (-) and hot flashes (+) follow a similar pattern increasing the temperature about 1 ° C prior to initiating sleep and descending upon waking. In the group hot flashes (-) there is an increase flushing-temperature (0.2 ° C) compared to group (+) hot flashes coincides with lower nighttime awakenings group of hot flashes - (ns). Women belonging to the negative group conducted more hot flashes daydreams (nap) than patients positive flashes. The positive patients sleep hot flashes worse than negative flashes presenting more nighttime awakenings. A slight tendency for patients to flushing group + before bedtime is appreciated that the flushing-group patients (about 20-30 minutes). When comparing the two groups using t student (and flushing flushing + -) No statistical significance was obtained in any variable except temperature (p 0.03).

Conclusions: The presence of vasomotor episodes in menopausal women could not establish differences in the rates of temperature, activity and position among women with higher frequency of hot flashes and women with lower presence or absence of these. -The quality of sleep is worse in women with higher frequency of hot flashes.

PP.43.17 CONTINUATION OF THE MEDITERRANEAN DIET IN THE SPANISH ADULT POPULATION. THE DIMERICA STUDY

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Objective: The objective of this study was to evidence on the adherence to the Mediterranean diet in the Spanish adult population and its distribution by place of residence.

Design and method: This is a descriptive and transversal study assessed to Spanish residents over 20 years old. Individuals were included in a survey and stratified by age, gender and place of residence. All subjects were interviewed using a validated survey including socio-demographic characteristics, lifestyle habits, prevalence of cardiovascular risk factors and continuation of Mediterranean diet. For an interval of confidence of 95, cohort had to include a minimum of 1537 individuals.

Results: A total of 1810 subjects were enrolled (49.3% males). The survey pointed out that 2.1% have more than 6 pieces of fruit per day, 7.2% between 2-4 times, 30% 3-4 pieces, half of the population eat 1 -2 pieces and only 6.9% do not eat fruits at all. Concerning vegetables, 9.6% of the cohort consumes them more than twice daily, 29.3% and 45.2% twice or once, respectively, only 1.2% never eats vegetables. Regarding cooking patterns, 89.9% uses olive oil daily. Regarding cold meat products, 9.5% recognize eating it more than 5 times per week, 24.7% between 3-4 times, 36.1% 1-2 times, 19.5% only once and 10.2% do not eat it at all. Moderate red wine intake was observed since 71.3% do not drink red wine or less than one glass per week. The global score of continuation of Mediterranean diet was valuated 4,7 ± 1,7 points (0 points was considered non follow up, 10 points maximum follow up). A significant inverse correlation was found between the prevalence of arterial hypertension and the score of Mediterranean diet follow up (p< 0.05). Besides, a positive correlation was also showed between abdominal circumference and such score (p£ 0.05).

Conclusions: Consistent evidence suggests that the Mediterranean diet continuation is insufficient in our studied population. Furthermore, in some areas, the follow up is even lower. The promotion of the Mediterranean dietary pattern is an effective and feasible tool for the prevention of cardiovascular disease such as hypertension and obesity.

PP.43.18 SPANISH LIFESTYLES IN ADULT POPULATION. THE DIMERICA STUDY

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Objective: The focus of this research was to examine the lifestyle related to the cardiovascular risk in the Spanish adult population.

Design and method: This is a descriptive and transversal study assessed to Spanish residents over 20 years old. Individuals were included in a survey and stratified by age, gender and place of residence. All subjects were interviewed using a validated survey including socio-demographic characteristics, lifestyle habits, prevalence of cardiovascular risk factors and continuation of Mediterranean diet. For an interval of confidence of 95, cohort had to include a minimum of 1537 individuals.

Results: A total of 1810 subjects were included (49.3% males), mean anthropometric values were: weight 76.9 ± 5.4 Kg and body mass index 28.3 ± 4.2 Kg/m2. The analysis of dietary intakes pointed out that 44.8% prefer oily fish, 46.7% white fish and 8.4% dislike fish. From those, 33.9% have fish less than once per week. Only 5.4% consume red meat more than 4 times per week, 25% consume 3 or 4 times per week and 46.5% once or twice per week. Besides, 23.1% have red meat less than once per week. Concerning alcoholic drinks, 30% individuals consume them only once per week. Nearly a third of the population have vegetables more than 4 times per week (29.8%), another third 3 or 4 times

(32.5%) and 26.5% only have them once or twice per week. Finally, 7.9% consume vegetables only once per week and 3.5% do not eat them at all. Interestingly, 16.5% of the cohort was on a diet. 13.2% recognize eating functional food usually, whilst 8.7% eat them only time to time, 35.6% do not eat them at all and 42.2% have not heard about functional food.

Conclusions: Analysis of the data revealed that lifestyle habits of the Spanish population are far from cardiovascular healthy. It is recommended to include dietary changes of target population in order to reduce cardiovascular risk factors.

PP.43.19 CONSUMPTION OF POLYUNSATURATED FATTY ACIDS BY YOUNG HYPERTENSIVE PATIENTS

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Objective: To evaluate the frequency of polyunsaturated fatty acids (PUFA) consumption by young adults treated with primary arterial hypertension (H).

Design and method: The study group consisted of 100 subjects, 60 males and 40 females, aged 18 – 45 years, mean age 33,4 +/- 6,6 yrs, duration of H 5,0 +/- 4,5 yrs. The study tool was the self-administered questionnaire assessing consumption of 7 groups of products (frequency and intensity of intake) during the last month. The food products were divided for “healthy” and “unhealthy” ones. Moreover, data on education, place of living, BMI, BP, HR and current drug treatment were collected.

Results: BP at entry was 137.5/88.4 mmHg, in 71% BP was controlled, 47,5% had university education, 80% lived in cities, BMI was 26,9 +/- 5,2 kg/m2, but 25.0% of pts were obese. In the last month the pts more often ate saturated fatty acids than PUFA as well as 3-fold often ate “unhealthy” than “healthy” products ($p<0.01$). In the diet of patients, especially men, dominated meat products (pork, poultry, beef and sausages) or eggs and dairy products (yellow cheese, butter, cream, milk, mayonnaise). Fishes were consumed at least 1 time per week only by 8% responders. Vegetable oils (mainly rape and olive oil) were the main sources of PUFA, but its regular consumption reported only 21% of pts. Vegetables, being an alternative to fish and seafood source of PUFA, have been rarely eaten. Patients living in cities ate more often walnuts, almonds and cereals than those from rural areas. BP values, BMI, type and amounts of antihypertensive drugs were not associated with differences in pattern of consumption of examined food products.

Conclusions: Eating habits in majority of young hypertensive patients are not in accordance with recommendations of the prevention of cardiovascular diseases. In this population pro-healthy dietary education should be implemented and action for change of inappropriate dietary habits is needed.

PP.43.20 WORKLOADS OF THE PREVIOUS WEEK MODULATE BLOOD PRESSURE AND METABOLIC REACTIONS TO AN EVERYDAY`S MENTAL LOAD

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Objective: It is well known that stress of rats is more intensive after pre-stress wokloads which took place even 24 hours ago. Since stress responses to the same stressor differ considerably also in humans, we investigated, whether not only personal idiosyncrasies but also different wokloads as far back as several days, whose fatigue already has escaped awareness, may influence stress as a reaction to everyday`s mental load.

Design and method: 16 officer trainees of the Austrian Army had to wait for sampling of 100 microlitres of capillary blood from fingertip up to 40 minutes. Since waiting for this trivial but unavoidable event could mobilize metabolic responses and change blood pressure, we checked their pH, pCO2, HCO3, base excess, ionic calcium and magnesium, lactate, blood glucose (by a Nova Phox - device, Rödermark, Germany) and blood pressure values (first sampling). The same procedure was repeated 2 months later, when they had to absolve a 21 km run in the previous week (second sampling).

Results: First sampling: Waiting for blood sampling after routine employment during the preceding week led to waiting time dependent diminishment in systolic blood pressure and glucose, while calculated free fatty acids, pH and ionic magnesium increased linearly. pH correlated negatively with pCO2 but not with HCO3. Second sampling: After a demanding run of the previous week, systolic blood pressure diminished during the first 15 minutes of waiting but increased subsequently. Blood glucose and lactate increased with waiting time, pH correlated negatively with calculated free fatty acids and pCO2.

Conclusions: After a week of routine deployment, 40 minutes of waiting reduced expectational stress, visibly by a fall in systolic blood pressure and epinephrine induced blood glucose. pCO2 correlated inversely with pH, underlining successful overcompensation. Demanding deployment, however, made itself felt even one week later by correlative increase of lactate and blood glucose along with waiting time, pointing - together with a late increase in systolic blood pressure - towards increasing expectational stress.
Thus workload in the past which is no more consciously felt, does still increase sensitively to mental load even after a whole week.

PP.43.21 EFFECT OF DIETARY NITRATE ON AMBULATORY BLOOD PRESSURE IN TREATED HYPERTENSIVES

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Objective: The incidence of elevated blood pressure (BP) is increasing. Plasma/ nitrate/nitrite, which indicate nitric oxide (NO) bioavailability, have been shown to be lower in hypertensives compared to matched controls. Previous research has demonstrated that dietary nitrate can increase plasma nitrate/nitrite and decrease BP in acute and chronic settings in multiple populations, including normotensives, subjects with peripheral vascular disease and in treatment naïve hypertensives. The antihypertensive effect of dietary nitrate appears attributable to its in vivo reduction to nitrite and eventually NO. Dietary nitrate has not been evaluated among subjects established on anti-hypertensive therapy.

Design and method: On day 0, eligible subjects wore an ambulatory BP monitor for ~24 hours and blood was taken. Subjects then consumed concentrated beetroot juice (140ml), containing 14mmol nitrate for 14 consecutive days. On day 14 subjects consumed their last nitrate dose and again wore an ambulatory BP monitor for ~24 hours with a blood draw. Instruction not to alter activities which may affect nitric oxide kinetics was provided. Subjects were divided into 2 groups: baseline ABPM <140/90mmHg and baseline ABPM >140/90mmHg.

Results: We recruited 21 subjects on anti-hypertensive treatment. Table 1 displays baseline demographics and changes in BP variables following nitrate supplementation.

Table 1: Demographics and changes in BP variables following nitrate supplementation.

	baseline ABPM <140/90mmHg	and baseline ABPM >140/90mmHg
N=	17	4
BMI (kg/m^2)	30.2 (27-42)	33.5 (28-43)
Age (y)	56.8 (27-72)	48.5 (33-66)
Male (%)	15 (88)	4 (100)
Change in 24h SBP after 14d of nitrate supplementation (mmHg)	+0.4	+2.7
Change in % SBP dipping after 14d of nitrate supplementation	-0.1	+2.2
Change in 24h DBP after 14d of nitrate supplementation (mmHg)	0	00.25
Change in % DBP dipping after 14d of nitrate supplementation	-0.8	+3.89
Change in 24h MAP after 14d of nitrate supplementation (mmHg)	-0.1	+1.75
Change in % MAP dipping after 14d of nitrate supplementation	-0.6	+3.0

Conclusions: Our results do not support the existing data suggesting an anti-hypertensive effect of dietary nitrate. Possible explanations may include co-existing morbidities and long standing hypertension with use of multiple anti-hypertensive agents. Further work is required to evaluate this therapeutic concept.

PP.43.22 INCIDENCE OF DYSLIPIDEMIA AMONG PATIENTS WITH ISCHEMIC HEART DISEASE. A COMPARATIVE ANALYSIS BETWEEN INDIAN AND BULGARIAN PATIENTS

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Objective: The objective of this study is to analyse and compare the incidence of Dyslipidemia among patients with Ischemic heart disease in Bulgaria and India.

Design and method: Cross-sectional study among patients with established Coronary Artery Disease admitted in the Department of Cardiology. Method: Study was carried out in the Cardiology Department – Dr. Georgi Stranski Hospital, Pleven- Bulgaria and Department of Cardiology, Lourdes Heart Institute and Neuro Center (LHINC), Cochin, Kerala, India .Participants of this study were 496 patients who were admitted in the Cardiology Department, Lourdes Heart Institute and Neuro Center (LHINC), Cochin, Kerala, India between 1st June 2012 and 31st Dec 2012 and 476 patients who were admitted in the Cardiology Department, Dr. Georgi Stranski Hospital Pleven- Bulgaria between 1st of January 2012 and 31st Dec 2013 with acute coronary syndrome or coronary angiographic or Electrocardiography evidence of ischemic heart disease. Patients were analysed for incidence of Dyslipidemia based on the fasting lipid profile and treatment history for dyslipidemia. Data collected from the patients, old medical records, Clinical Examination and Laboratory results of the patients were analyzed for the study.

Results: From the study, it was seen that the incidence of dyslipidemia is 71% among Indian patients with Ischemic Heart Disease, and incidence of dyslipidemia is 82% among Bulgarian patients with ischemic heart disease ($p > 0.01$).

Conclusions: There is no statistically significant difference in the occurrence of dyslipidemia among patients with Ischemic Heart Disease in Indian and Bulgaria. Proper management of cholesterol and triglyceride levels is significant in both the population for the prevention of Ischemic Heart disease.

PP.43.23 COMPARISON OF EFFICACY OF INTENSIVE VERSUS MILD PITAVASTATIN THERAPY ON LIPID AND INFLAMMATION BIOMARKERS IN HYPERTENSIVE PATIENTS WITH DYSLIPIDEMIA

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Objective: Intensive as compared to mild statin therapy has been proven to be superior in improving cardiovascular outcome, whereas the effects of intensive statin therapy on inflammation and lipoprotein biomarkers are not well defined.

Design and method: This study assigned essential hypertensive patients with dyslipidemia to 6 months administration of mild (1 mg/day, n=34) or intensive pitavastatin therapy (4 mg/day, n=29), and various lipid and inflammation biomarkers were measured at baseline, and 3 and 6 months after the start of treatment.

Results: Both pitavastatin doses were well tolerated, and there were no serious treatment-related adverse events. After 6 months, significant improvements in total cholesterol, triglycerides, low-density lipoprotein (LDL-) cholesterol, LDL/high-density lipoprotein cholesterol (LDL/HDL), apolipoproteins B, C-II, and E, apolipoprotein-B/apolipoprotein-A-I (Apo B/Apo A-I), and malondialdehyde (MDA-) LDL were observed in both groups. Compared with the mild pitavastatin group, the intensive pitavastatin therapy showed significantly greater decreases in C reactive protein ($F=3.76$, $p < 0.05$), total cholesterol ($F=10.65$), LDL-cholesterol ($F=23.37$), LDL/HDL ($F=12.34$), apolipoproteins B ($F=19.07$) and E ($F=6.49$), Apo B/Apo A-I ($F=13.26$), and MDA-LDL ($F=5.76$) ($p < 0.01$, respectively).

Conclusions: Intensive pitavastatin therapy may have a more favorable effect not only in decreasing LDL-cholesterol but also in pleiotropic benefits in terms of improvement of apolipoproteins, inflammation, or oxidation.

PP.43.24 POLYUNSATURATED FATTY ACIDS REDUCE HDL CHOLESTEROL IN PRIMARY HYPERTENSIVE PATIENTS INDEPENDENTLY OF METABOLIC SYNDROME PRESENCE

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Objective: In this study we evaluated the association between fatty acid composition of red blood cell (RBC) membranes as a marker of fatty acids intake and the metabolic profile of hypertensive patients with and without metabolic syndrome (MS).

Design and method: Fifty patients (age 63±8 yr., M/F=24/26) with primary hypertension were divided in those with and without MS (36% and 64%, respectively) according to the 2003 AACE criteria. Fatty acid composition of RBC membranes, variables of glucose and lipid metabolism, and homeostasis model assessment (HOMA) as index of insulin resistance, were evaluated at baseline and after 6 months of a diet characterized by 3 times weekly fish meals supplementation. The diet was designed to increase the polyunsaturated to saturated fatty acid (PUFA/SFA) ratio in RBC membranes.

Results: At baseline hypertensive patients with MS had higher BMI, HOMA index, and triglycerides, glucose, insulin, and C-peptide levels, and lower HDL cholesterol, PUFA, PUFA/SFA ratio, and n-6 PUFA than patients without MS. Univariate analysis showed a strong and independent direct association between PUFA/SFA ratio in RBC membranes and HDL cholesterol levels ($r=0.606$, $P<0.001$). After 6 months of fish meals supplementation only 11 patients in both groups of patients, with and without MS, increased their PUFA/SFA ratio in RBC membranes (61% and 34%, respectively). The only predictor of such an increment was the lower baseline PUFA/SFA ratio (Odds Ratio 2.14e-20, 95% CI from 5.24e-40 to 0.87) in a model including also age, sex, and MS presence. HDL cholesterol increased in both groups of patients with and without MS (+12%, $P<0.050$ and +16%, $P<0.001$, respectively), whereas only patients with MS had an increment in insulin and C-peptide levels (+27% and +29%, respectively, both $P<0.05$).

Conclusions: HDL cholesterol is strongly and independently associated to the baseline PUFA/SFA ratio in RBC membranes and also with the PUFA/SFA ratio increment after fish meals supplementation. Although these findings suggest a positive effect of the PUFA/SFA ratio on HDL cholesterol independently of MS presence, the concomitant rise in insulin production in patients with MS could limit the overall beneficial effect of the intervention in these patients.

PP.43.25 SHORT AND LONG TERM OF A 3-MONTH KETOGENIC DIET ON CARDIOVASCULAR RISK PROFILE IN THE SETTING OF CLINICAL PRACTICE

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Objective: Ketogenic diets have been shown in the short-term to promote weight loss, and to improve some metabolic parameters of obese patients, in highly specialized obesity clinics. Our aim was to test the short and long-term effects of a 3-month ketogenic diet on the cardiovascular disease risk profile of overweight-obese patients in the setting of general practice.

Design and method: We consecutively recruited 377 subjects (M: 22%, W: 78%; mean age: 46±10 years, mean BMI: 31±3). They were instructed to follow a 3-month ketogenic diet, and then to gradually recover to a balanced diet with a follow-up visit at 6 and 12 months. Changes in studied parameters was evaluated by ANOVA for repeated measures.

Results: After three months, there was a significant improvement in body weight (-7,6±5,6 kg), BMI (-2,8±2,3 kg/m2), Waist circumference (-7,1±4,4 cm), Index of Central Obesity (-0.04±0.02), and % of fat (-3,8±3,8) (all, $p<0.01$), that further improved at 6 months ($p<0.05$), and then remained constant till 12 months. FPG (-8,7±15, 3 mg/dL), HbA1c (-0.2±0.7%), LDL-C (-19,4±31,2 mg/dL), TG (-23,4±61,2 mg/dL), gGT (-4,0±11,4 mg/dL) and SBP (-10,5±12,8 mmHg), DBP (-2,2±6,2 mmHg), PP (-8,4±12,6 mmHg) improved after 3 months and the stabilized till 12 months. HDL-C (+1,8±11,7 mg/dL), and SUA (-0,4±2,9 mg/dL) only improved after 6 months ($p<0.05$) and then stabilized till the end of the study. No significant change in renal parameters or electrolytes changes was observed beyond a mild by significant decrease in calcemia ($p<0.05$). The long term body weight loss was higher in those subjects experiencing a ketonuria in the first period of diet, and was directly related to the baseline body fat mass and inversely to the patient age.

Conclusions: A 3-month ketogenic diet safely improve a large number of anthropometric and cardiometabolic parameters in the setting of general practice and these effects seems to be maintained on the long-term after diet normalization.

PP.43.26 BERBERINE AND MONACOLIN EFFECTS ON WOMEN WITH OESTROPROGESTIN-INDUCED HYPERCHOLESTEROLEMIA

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Objective: One of the most frequent side effect of oral contraceptives use is a stable alteration of the lipid profile. This could be even more relevant in women affected by polycystic ovary syndrome (PCOS). Considering the importance of a balanced lipid profile in cardiovascular prevention and that the exposure to the drugs could be many years long, our aim was to investigate the possible beneficial effect of a largely tested low-dosed combined lipid-lowering nutraceutical on dyslipidemias induced by oestroprogestins prescribed to young women for different indications.

Design and method: We prospectively enrolled 84 patients in primary cardiovascular disease prevention, with low estimated cardiovascular disease risk (<5% according to the ESC/EAS guidelines), and LDL-C increased above normal value (LDL-C>130 mg/dL) after the use of at least two different oral oestroprogestins treatments. Forty-four women were prescribed oral oestroprogestins for PCOS, while 40 for pure contraception. The tested nutraceutical contained berberine 500 mg/tab and monacolins 3 mg/tab was prescribed to all enrolled patients, associated the previously prescribed standard lipid-lowering diet.

Results: After three months of nutraceutical treatment, we observed a significant improvement in BMI (-1.5±0.8%, p<0.001), FPG (-6.9±5.8%, p<0.001), HOMA index (-3.5±5.6%, p<0.001), TC (-20.1±6.6%, p<0.001), LDL-C (-25,3±8.9%, p<0.001), HDL-C (+14.1±2.2%, p<0.001), TG (-29.9±25.2%, p<0.001) and hsCRP (-2.5±2.4%, p= 0.019). Similar results have been obtained even repeating the analysis by subgroups, beyond hsCRP that significantly improved in PCOS patients compared to both the baseline and the non-PCOS group.

Conclusions: It appears that the tested combined lipid-lowering nutraceutical is able to equally improve lipid metabolism in oral contraceptive induced hypercholesterolemia in women affected or not by PCOS.

PP.43.27 CASE STUDY OF ESSENTIAL HYPERTENSION: EFFICACY OF AN ANTIPSORIATIC DIETARY APPROACH

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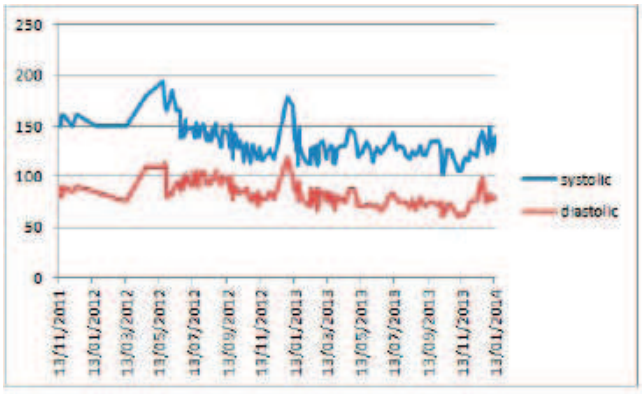
Objective: To observe the effect of an antipsoriatic-type personalized dietary intervention in hypertension.

Design and method: A personalized nutrition approach was developed, using the experience gained from decade-long observation of dietary effects on psoriasis and blood pressure (BP), which reflect the association of psoriasis and hypertension (cpcpsoriasis.blogspot.com; J Hypertension 2012; 30: e-suppl 1, poster 158; J Hypertension 2013, 31:433). Proposals to use this dietary intervention were approved by the UNTH ethics committee. Personalized dietary counseling was given to a 45 year old man with hypertension. (He declined antihypertensive medication for fear of adverse effects.) He monitored home BP using a wrist device (Microlife BP3BU1) and later an arm device (Omron M2). Data were analysed by linear regression using SPSS v17.

Results: In this ongoing live case study of essential hypertension, 168 readings over 2 years show a significant decline of BP with time (p<0.001), attainment of normal BP, and occasional relapse attributable to dietary indiscretion. It took about six months for the propositus to effectively apply the dietary advice (see figure).



Conclusions: These observations support the concept of an adverse diet-genome interaction in the aetiopathogenesis of chronic disease, and would warrant the conduct of randomized controlled trials of personalized dietary intervention to abate hypertension.

PP.43.28 INFLUENCE OF MONASTIC LIFE ON CARDIOVASCULAR HEALTH: THE MOUNT ATHOS EXPEDITION

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Objective: Mount Athos situated in Halkidiki peninsula in Northern Greece is an independent, exclusively intended to monastic life area, regrouping 20 Christian Orthodox monasteries, in which around 1000 male monks spend their life with prayer, meditation and work, complying with quite a peculiar life style, in terms of diet, pace of life (or circadian rhythm), spirituality and environmental stress. The aim of the present study was to evaluate metabolic parameters, 24h BP profiles, LV function and structure and arterial wall stiffness and thickness in a population of monks living in the biggest Mount Athos monastry (Vatopedi). In the present abstract we describe the methodology of this study and some preliminary results.

Design and method: This study was carried out between 15 and21 September 2013. 94 male monks living all in Vatopedi monastry were recruited. All measurements were performed on site. Monks gave their informed consent and have a complete physical exam, conventional and 24h ambulatory(A) BP measurements with validated oscillometric devices, standard blood tests under fasting conditions, EKG, measurements of AGEs deposits on skin, LV echography, carotid artery echography and carotid-femoral pulse wave velocity (PWV). They all answered detailed questionnaires about their diet, activities in the monastry, sleep duration and demography.

Results: Studied monks had a mean age of 42.0±13.0 years (mean±SD) and had been living in Mount Athos for an average period of 14.6 years. Mean BMI was 26.2±5.2 kg/m2 and waist circumference was 90.8±13.2 cm. Casual SBP and DBP were 117.5±15.7 and 73.7±10.6 mmHg respectively, whereas HR was 71.1±9.6 bpm. Total cholesterol was 190±46 mg/dL and glycaemia was 82.5±32.7 mg/dL. LV parameters, aortic stiffness (PWV) and carotid parameters and ABPM data are still being analyzed.

Conclusions: The obtained results in a sample of 94 monks living for several years in strict monastic conditions, provide the possibility to assess the influence of a very particular environment on metabolic and cardiovascular profiles. These results will be compared with those of age-matched males living in the region.

POSTERS' SESSION

POSTERS' SESSION PS44
ATHEROSCLEROSIS

PP.44.01 OXIDIZED LOW DENSITY LIPOPROTEIN STIMULATES PROLIFERATION AND MIGRATION OF HUMAN AORTIC VASCULAR SMOOTH MUSCLE CELLS VIA UP-REGULATION OF PRORENIN RECEPTOR

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Objective: Prorenin receptor (PRR), as a new member of renin-angiotensin-aldosterone system (RAAS) plays a critical role in cardiac fibrosis and albuminuria in diabetic angiotensin II type-1-receptor-deficient mice. Oxidized low density lipoprotein (ox-LDL) as a key risk factor of atherosclerosis initiation and progression has been observed to activate RAAS system. However the relevance of ox-LDL and human aortic smooth muscle cells (HASMCS) function switching still remains unclear. In this research, we clarified the role of PRR on proliferation and migration of HASMCs stimulated by ox-LDL.

Design and method: The existence of PRR on HASMCs was identified by immunofluorescence stain. The expression of PRR and the corresponding phosphorylation of P38MAPK were assessed by western blot. The roles of PRR in proliferation and migration of HASMCs were figured out by blocking it with siRNA. SB203580, the inhibitor of P38, was added to explore the effects of P38 signal transduction. The proliferation and migration of HASMCs were estimated by WST-8 assay and Boyden chamber chemotaxis assay respectively.

Results: Our results showed that PRR was expressed in cultured HASMCs. Ox-LDL increased the PRR expression in a dose and time dependent manner. Then the up-regulation of PRR activated the phosphorylation of P38 protein, since knock down of PRR completely blocked it. Ox-LDL induced the proliferation and migration of HASMCs. Knock down of PRR, dramatically inhibited both of these effects. SB203580 reduced the proliferation stimulated by ox-LDL, which showed no significant difference from that of blocking the PRR directly. But the decrease of HASMCs migration in the presence of SB203580 was much less than the suppression of PRR.

Conclusions: As a member of the complicated MAPK signal transduction network, P38 may not be the only pathway connecting PRR and HASMCs activated by ox-LDL. Ox-LDL may also activate other receptors like LOX-1 or angiotensin II receptor(type 1) to mediate HASMCs proliferation. And the PRR activation can activate multiple signal transduction pathways as well. Taken together, ox-LDL can activate P38 signal transduction pathway mediated by PRR, then increase the proliferation and migration of HASMCs.

PP.44.02 THE ASSOCIATION BETWEEN CORONARY CALCIFICATION AND ADENOMATOUS POLYP OF COLON IN KOREAN ADULTS

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Objective: Adenomatous polyp of colon is a precancerous lesion and screening for colon polyp has been shown to reduce colorectal cancer mortality. Many studies have shown that the adenomatous polyp of colon and cardiovascular disease share common risk factors. Coronary calcification is closely related with mural atheromatous plaque and proportionally associated with the severity of atherosclerotic disease. However, little has been written about the relationship between coronary calcification and atheromatous polyp. We sought to investigate whether coronary calcification is associated with the adenomatous polyp of colon.

Design and method: Among 2045 adults who were examined in health check-up center in Gangnam Severance hospital, we examined the association between coronary calcium score (CCS) as a measurement of coronary calcification by multi-detected row computed tomography (MDCT) and the presence of adenomatous polyp of colon as determined by colonoscopy. CCS values were categorized separately as follows: 0, 1-17, 18-105, and >=106. The odds ratios (ORs) and 95% confidence intervals (CIs) for adenomatous polyp of colon were calculated across each group of CCS score.

Results: The prevalence of adenomatous polyp of colon was increased according to high coronary calcium score groups with statistical significance ($p<0.001$). After adjusting for confounding variables, the adjusted ORs (95% CIs) for adenomatous polyp of colon according to each of the four groups of CCS were 1.00 (reference), 1.46 (0.92-2.32), 1.89 (1.17-2.99), and 3.57 (2.24-5.69).

Conclusions: A higher level of CCS was found to be independently and strongly associated with the presence of adenomatous polyp of colon, regardless of traditional cardiovascular risk factors. This finding suggests that people who have high risk for coronary atherosclerosis should be considered for further evaluation of adenomatous polyps of colon.

PP.44.03 AN EXAMINATION ABOUT EVALUATION OF BLOOD PRESSURE AND PULSE WAVE VELOCITY IN YOUNG HEALTHY PEOPLE

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Objective: Pulse Wave Velocity (PWV) was an examination to measure the level of atherosclerosis in many hospitals in recent years. Previous report showed that Risk factor of atherosclerosis as hypertension, diabetes mellitus, hyperlipidemia, aging, smoking regulates the PWV fast.
On the other hand, PWV in young people were correlative with obese and hyperlipidemia in previous report, but correlation PWV with other risk factors were not elucidated. Here, we paid attention to the relationship between PWV and Familial History (FH) and Blood Pressure (BP) in Healthy, non-smoking youths without abnormal data of blood test in medical examination (blood sugar, lipid, liver and renal function) in this study.

Design and method: Non-smoking healthy young people, 72 men and 30 women, without abnormal data of blood test in medical examination was entry in this study. Medical examination by interview was done to all of them. If he or she had a familial history of hypertension, diabetes mellitus, hyperlipidemia, ischemic heart disease, cerebrovascular disease in father or mother, it counted as two point, and also in grandfather or grandmother, as one point by each risk factor. And in this study, called three former risk factors as "disease risk (DR)", two latter risk factors as "outbreak risk (OR)".

Results: Mean PWV was 1191.5cm/s in men, 1119.5 cm/s in women. Next we sort these data into ascending-order, and divided into "low PWV (LP)" and "high PWV (HP)"bound on the median. Men recorded LP 1088.0cm/s vs HP 1298.0cm/s, women recorded LP 1004.5cm/s vs HP 1234.5cm/s. ($P<0.05$, Both LP and HP) DR of men in LP 0.40 vs HP 1.32, women in LP 0.44 vs HP 1.56. ($P<0.05$, Both LP and HP).
In BP, Men recorded LP 117.9/65.7mmHg vs HP 125.6/71.5mmHg, women recorded LP 106.0/62.2mmHg vs HP 111.2/65/9mmHg. ($P<0.1$, Both LP and HP).

Conclusions: In this study, we conclude that familial history and BP may correlate with PWV in young healthy people especially in HP. These result was appropriate because of the median of PWV was equal the previous data of healthy people.

PP.44.04 REDUCTION OF BLOOD PRESSURE IN PATIENTS UNDERGOING STATIN THERAPY

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Objective: Unregulated blood pressure is an adverse prognostic factor in patients, especially when combined with dyslipidemia. Inhibitors of 3OH-3methyl-glutaryl-coenzyme A reductase reduce the risk of cardiovascular events and death in both primary and secondary prevention of cardiovascular disease.

Although the long-term benefit by statin treatment is largely attributed to their cholesterol-lowering action, increasing attention focuses on additional actions called pleiotropic effects. The present study examines the correlation between blood pressure and statin therapy.

Design and method: We included 40 patients with first-diagnosed dyslipidemia (36 male, 4 female, mean age 42±8). Before statin therapy (atorvastatin 20 mg), fasting blood tests were performed (mean cholesterol 240 ±50 mg/dl, mean LDL- C 164±30 mg/dl, HDL38±13, triglycerides 180±40 mg/dl, glucose 90 ± 20 mg/dl).Also, arterial pressure was recorded (mean systolic arterial pressure 140±10 mmHg, mean diastolic pressure 80±10 mmHg). After 6 months of therapy, we repeated blood essays and arterial pressure measurement. Statistical analyses were performed using SPSS software. (Version 17). $P < 0.05$ was considered statistically significant.

Results: A significant correlation was found between statin therapy and systolic arterial pressure (p value 0.002).The patients presented a decrease in total serum cholesterol and LDL cholesterol, while there was an increase in HDL cholesterol. Simultaneously, we observed a decrease in blood pressure (systolic blood pressure by 2 mmHg) while diastolic arterial pressure did not affected.

Conclusions: Statin therapy is associated with reduced systolic arterial blood pressure. Our study, emphasizes the pleiotropic effect of statin therapy. Apart from the known effects of statins, on lipid profile and markers of subclinical atherosclerosis, it seems to affect positively on the reduction/stabilization of blood pressure to normal levels, due to anti-atherosclerosis result.

PP.44.05 VITAMIN D IS ASSOCIATED WITH CAROTID INTIMA-MEDIA THICKNESS BUT NOT WITH THE PREVALENCE OF CAROTID ATHEROSCLEROTIC PLAQUE IN GENERAL POPULATION

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Objective: Evidence suggests low vitamin D concentration may increase risk for cardiovascular disease. However, little is known about the association between vitamin D and atherosclerosis. We aimed to analyze the relation between carotid atherosclerosis or intima-media thickness and serum vitamin D in the sample of general population.

Design and method: The study group comprised of 175 subjects recruited from general population. SpaceLabs 90207 oscillometric monitors were programmed to measure ambulatory blood pressure (BP) each 15 min. daytime (6.00 - 22.00) and each 30 min. nighttime. Common carotid artery intima-media thickness (IMT) was measured at both sides with B-mode ultrasound (VIVID7, GE, Norway). Vitamin D (25(OH)D) concentration was measured in serum. Database management and statistical analyses were performed with SAS software (SAS Institute, Cary, NC), version 9.3.

Results: The study group included 77 men and 98 women, mean age = 48.5±14.8 years, 110 subjects had hypertension. Average serum vitamin D level was 19.7±8.0 ng/ml. Based on carotid ultrasound, 51 participants were diagnosed as having atherosclerotic plaque. On multivariate analyses, with adjustment applied for age, sex, body mass index, 24-hour systolic BP, smoking and serum total cholesterol, we did not observe any differences in vitamin D level between subjects with and without carotid atherosclerosis (20.4±9.4 vs 19.5±7.4 ng/ml, p=0.55). In subjects without carotid atherosclerosis, carotid IMT increased with decreasing concentration of 25(OH)D, increment 2.0 μm per 10 ng/ml lower 25(OH)D, p=0.048. We did not observe such association in the subgroup with carotid atherosclerosis and in the total study population.

Conclusions: These findings from a population-based cohort suggest a potential role for vitamin D in carotid remodeling. We did not observe any association between vitamin D and prevalence of carotid atherosclerotic plaque, however additional research is needed to determine whether vitamin D may influence the progression to carotid atherosclerosis.

PP.44.06 THE IMPLICATION OF CIGARETTE SMOKING AND SMOKING CESSATION ON MACROPHAGE CHOLESTEROL EFFLUX IN CORONARY ARTERY DISEASE PATIENTS

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Objective: We investigated the ABCA1 and ABCG1 expression and function in mediating cholesterol efflux from macrophages of cigarette smoking patients with coronary artery disease before and after smoking abstinence.

Design and method: This is a randomized, prospective and parallel controlled study. All the subjects, including 17 healthy non-smokers, 35 healthy chronic smokers and 32 CAD smokers, were recruited in Peking Union Medical College Hospital (PUMCH) (Beijing, China). Smoking subjects were randomly assigned in a 1:1 ratio to either smoking cessation subgroup or continued smoking subgroup. Smokers randomized into smoking cessation subgroup were asked to stop smoking for at least 90 days. There were 14 healthy smokers and 13 CAD smokers finished 90 days smoking cessation. Blood samples were collected from all subjects. Peripheral blood monocyte cells were differentiated into macrophages, real time PCR and immunoblots were performed and cellular cholesterol efflux were tested to evaluate ABCA1 and ABCG1 expression and function in macrophages from subjects.

Results: We found that ABCA1 expression, as well as its function in mediating cholesterol efflux to apoA-1, was decreased in macrophages from both healthy and CAD smokers compared with those from non-smokers at baseline. There was no obvious difference in ABCG1 expression among the three study groups. Both HDL-cholesterol and apoA-1 levels were substantially lower in plasma from smoking subjects compared with that in non-smokers. ABCA1 expression and its function in mediating cholesterol efflux were reversed by 3 months smoking cessation in CAD group. ABCA1 function appeared an improved tendency in healthy smoking cessation group. ABCG1 expression did not change after smoking cessation in each group. ABCA1 mRNA and protein expression were inhibited by tar rather than nicotine and carbon monoxide by inhibition of Liver X receptors.

Conclusions: Chronic cigarette smoking impaired ABCA1 protein expression and its function in mediating cholesterol efflux in macrophages. ABCA1 expression as well as its function could be reversed by tobacco abstinence in CAD patients. Inhibition of ABCA1 expression was due to tar rather than nicotine or carbon monoxide in tobacco.

PP.44.07 IDENTIFICATION OF FACTORS THAT INFLUENCE ARTERIAL STIFFNESS IN SUBJECTS WITH METABOLIC SYNDROME

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Objective: Knowing the predictive value of pulse wave velocity for cardiovascular events, it is extremely important to identify the factors responsible for the increase in arterial stiffness.
Objective Identification of factors that influence arterial stiffness, i.e. pulse wave velocity (PWVAo) and the augmentation index (AixAo), in subjects with metabolic syndrome (MetS).

Design and method: The study included 150 subjects with metabolic syndrome, diagnosed based on IDF criteria, with a mean age of 60.40±9.47 years. All patients underwent anthropometric measurements, biochemical and arterial determinations. Arterial parameters were determined using the TensioMedT-MArteriograph.

Results: A significant correlation was found between pulse wave velocity and age ($r= 0.252, p<0.001$) , systolic blood pressure ($r=0.344$, $p<0.001$), diastolic blood pressure ($r=0.148$, $p=0.032$) and triglycerides ($r=0.206$, $p=0.003$). On the other side, AixAo significantly correlated with age ($r= 0.345$), weight ($r = - 0.432$), body mass index ($r = - 0.318$), abdominal circumference ($r = - 0.346$) systolic and diastolic blood pressure($r = 0.353$, respectively $r = 0.221$), total cholesterol ($r = 0.150$) and HDL cholesterol ($r = 0.305$).
Of all parameters considered (age, BMI, abdominal circumference, systolic blood pressure, diastolic blood pressure, glycemia, total cholesterol, LDL-cholesterol, HDL-cholesterol, triglycerides), the most important determinant of pulse wave velocity is systolic blood pressure. In multivariate analysis, systolic blood pressure (determination coefficient: 3.586, $p<0.0001$), serum triglycerides (determination coefficient: 3.579, $p<0.0001$) and age (determination coefficient: 3.510, $p=0.001$) are independent predictive factors for pulse wave velocity.

Conclusions: Despite the fact that both pulse wave velocity and augmentation index represents arterial stiffness parameters, seems to be influenced in a different manner by anthropometric and biochemical parameters.

PP.44.08 THE IMPACT OF ARTERIAL STIFFNESS ON THE PERFORMANCE OF PERCUTANEOUS CORONARY INTERVENTION DURING ACUTE CORONARY SYNDROME

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Objective: Increased arterial stiffness is an accepted cardiovascular risk factor. However, the effect of arterial stiffness on the performance of percutaneous coronary intervention (PCI) during acute coronary syndrome (ACS) is not well known. The aim of this study was to evaluate the impact of arterial stiffness measured by pulse wave velocity (PWV) on acute gain and late loss after PCI during ACS.

Design and method: Data from 253 consecutive patients (342 lesions) who underwent PCI using drug eluting stents due to ACS and PWV study were analysed.

Results: Before Procedure, the minimal lumen diameter (MLD) was 0.82 ± 0.49 mm. In addition, those of post-procedure & 10-month follow-up were 2.34 ± 0.40 mm and 2.00 ± 0.65 mm, respectively. Mean PWV, acute gain and late loss were 1683 ± 386 cm s(-1), 1.52 ± 0.54 mm and 0.15± 0.54mm. There was negative relation between PWV and acute gain (correlation coefficient = -0.161 ; p=0.029). However, there was no relation between PWV and late loss (correlation coefficient = -0.032 ; p=0.666) In addition, acute gain was smaller in hypertensive patients than normotensive patients. (1.46 ± 0.51 mm vs. 1.67 ± 0.59 mm ; p=0.012).

Conclusions: Increased arterial stiffness is unfavourable for acute gain of the patients undergoing PCI during ACS. However, this is not prognostic factor for late loss. Therefore, we should make more effort to get sufficient acute gain when faced with the patients of ACS who show high PWV, which means increased arterial stiffness. Moreover, hypertensive patients are more likely to get less acute gain during ACS.

PP.44.09 LEPTIN/ADIPONECTIN RATIO AND RELATION WITH LIPIDOGRAM IN OVERWEIGHT, HYPERTENSIVE PATIENTS WITH CARDIOVASCULAR EVENT

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Objective: According to recent studies, leptin/adiponectin ratio presents better marker of atherosclerosis, insulin resistance, metabolic syndrome and cardiovascular event than leptin and adiponectin concentrations alone. Most of the studies were done in obese individuals. This study analyses relationship between leptin/adiponectin ratio in the early stages of increasing body fat, in overweight with developed metabolic syndrome and myocardial infarction in personal history. The aim of the study was to determine the relationship of cardiovascular risk factors with leptin/adiponectin ratio, to determine role of serum lipid levels in relation with leptin/adiponectin ratio but in overweight individuals.

Design and method: Study included 80 patients (40 male, 40 female), body mass index 25-30 kg/m2, visceral type of obesity, dyslipidemia, hypertension and myocardial infarction in the personal history. Exclusive criteria were obesity, diabetes mellitus and renal disease. Anthropometric, biochemical and cardiovascular measurements were done to all individuals. Serum leptin concentration was measured with radioimmunoassay test and total adiponectin level with enzyme immunoassay test.

Results: Leptin/adiponectin ratio is significantly lower in male group than in female group of subjects. Levels of cholesterol , triglycerides, LDL were higher and HDL was lower in male group according to reference values. Cholesterol and LDL were higher but triglycerides and HDL were in regular range in female group. The ratio of leptin/adiponectin showed no significant correlation in the male and female group of examiners with the level of cholesterol, triglycerides, LDL and HDL.

Conclusions: In overweight persons (with central type of obesity, increased leptin level, decreased adiponectin level, hypertension, coronary disease but without diabetes mellitus) leptin/adiponectin ratio in relation with lipidogram concentrations showed that dyslipidemia is not main part of complex atherosclerotic pathophysiology. Dyslipidemia is present in overweight with metabolic syndrome, but the other risk factors in these patients could be more important, such as hypertension. Also, it is important to emphasize gender differences in adipokine levels and ratio, which may be important in the pathophysiology of metabolic processes that affect individual to each risk factor.

PP.44.10 RELATIONSHIP AMONG AMBULATORY ARTERIAL STIFFNESS INDEX, AUGMENTATION INDEX AND PULSE WAVE VELOCITY IN PATIENTS WITH HYPERTENSION

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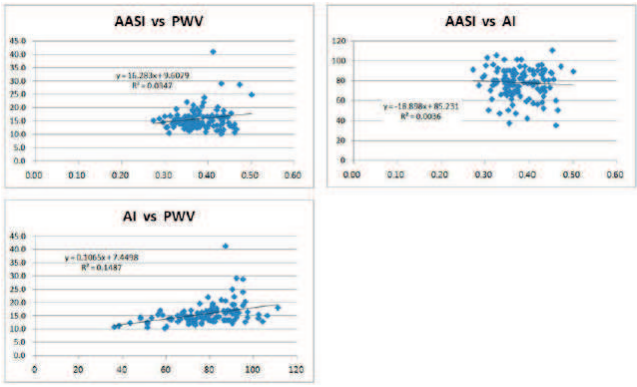
Objective: Ambulatory arterial stiffness index (AASI) , the slope of diastolic on systolic pressure from 24-hour ambulatory recordings, is known to reflect not only vascular stiffness but also autonomic dysfunction.

Design and method: We collected the data of hypertensive patients who took the test of ambulatory blood pressure monitoring, augmentation index(AI) and pulse wave velocity (PWV) measurement. We examined the association among them.

Results: The data of total 111 patients (male 64.8%, mean age 47.1±15.4 years) were collected. AASI had significant correlation with AI (R2=0.003, p=0.015) and PWV (R2=0.035, p=0.038). AASI did not correlated with standard deviation of mean BP, a parameter of BP variability. AI correlated well PWV (R2=0.1487).

Conclusions: The result of this study shows that AASI correlate AI and PWV, surrogate marker of arterial stiffness but not mean BP variability.



PP.44.11 RELEVANCE OF SUBCLINICAL ATHEROESCLEROSIS IN PRIMARY PREVENTION CARDIOVASCULAR RISK STRATIFICATION

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Objective:
1ºAnalize the proportion of patient that due to subclinical atherosclerosis in their carotid ultrasound change their risk category according to NCEP-ATPIII.
2ºAnalyze the proportion of patients that reach LDL goal levels according to NCEP ATPIII.
3ºAnalyze if there are differences in insulin resistance in the different NCEP ATP III risk categories.

Design and method: We have studied systematically 1164 consecutive subjects that have consulted for the first to our cardiovascular prevention unit. We have selected 850/1164 (73%) subjects undergoing primary prevention assessment that have completed their clinical, laboratory and carotid ultrasound (CUS) evaluation. We have excluded patients with history of diabetes and/or coronary artery disease and/or peripheral vascular disease. Subclinical atherosclerosis was defined as one or more plaques detected by carotid ultrasound using ARIC criteria. Insulin Resistance (IR) was determined by HOMA with 2,5 as cut off value (With IR >2,5). Two risk subgroups were analysed: 1) Low risk (0-1 risk factors or >2 risk factors with 10 year Framingham risk < 10%) and, 2) Moderate risk (>2 risk factors with 10 year Framingham risk > 10%)

Results: The proportion of patients that changed their risk category after carotid artery plaque assessment for each risk category is shown in the table 1 on the following page.
The Odds Ratio of subclinical atherosclerosis in the moderate risk group was 2.8 (95% CI: 1.9-4.2). The proportion of patients reaching the different levels of LDL goal and insulin resistance are detailed in the table 2.

Table 1:

	Low Risk n: 713	Moderate Risk n:137	P Value
Change in Risk Category due to CUS Plaque assessment	18% (95% CI: 15-21%)	38% (95%CI: 30-46%)	P <0.001

Table 2:

	Low Risk n: 713; 100% (95%CI)	Moderate Risk n:137; 100% (95%CI)	P Value
LDL at goal*	71% (68-75%)	39 (32-48%)	P< 0.001
LDL < 100mg/dl	20% (17-23%)	15% (10-21%)	P NS
IR HOMA (≥2.5)	30% (26-33%)	54% (45-62%)	P< 0.001

*LDL at goal: <160mg/dl in patients with 0-1 risk factors and <130 mg/dl in patients with ≥2 risk factors

Conclusions: With Carotid US assessment 4/10 in the moderate risk subgroup and 2/10 in the low risk subgroup changed their risk category. With this new categorization only 1-2/10 patients reached the LDL goal of <100mg/dl. Carotid US assessment may be a helpful tool in the risk categorization of patients in primary prevention.

PP.44.12 PREVALENCE OF SUBCLINICAL ATHEROESCLEROSIS, INFLAMMATORY RESPONSE AND INSULIN RESISTANCE IN A HYPERTENSIVE PATIENTS IN PRIMARY PREVENTION SETTING

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Objective: 1º Analyze the prevalence of subclinical atherosclerosis, inflammatory response and insulin resistance (IR) in a hypertensive patients in primary prevention. 2º Analyze the independent association between hypertension (HT) and the following co variables: Age, Subclinical atherosclerosis (sATS), PCRus and HOMA.

Design and method: We have studied 1043 consecutive subjects that have completed their clinical, laboratory and carotid ultrasound (CUS) evaluation. We have excluded patients with diabetes and/or coronary artery disease and/or peripheral vascular disease. sATS was defined as one or more plaques detected by CUS using ARIC criteria. Infl. was defined by a usPCR >2 mg/dl. IR was determined by HOMA with 2,5 as cutoff value. We performed bivariate analysis comparing the different clinical, laboratory and ultrasound variables in patients with HT and those that did not have history or diagnosis of hypertension (No HT). We performed a multivariate analysis with logistic regresión with the Wald method to assess association of HT and the selected co variables.

Results: Prevalence of sATS, Infl. and IR can be observed in the table. The following variables were significantly associated with HT in the bivariate analysis: Age (57±12 vs 49±12 years, p<0.001); male gender (68% vs 22%, p:0.01); dyslipidemia (36% vs 29%, p<0.05); SBP (129 ±14 vs 116 ±13 mmHg, p<0.001); DBP (81 ±10 vs 75 ±10 mmHg, p<0.001); BMI (28 ±5 vs 26 ±5, p <0.001); 10 year Framingham Risk Score (7.02 ±6.27 vs 3.71 ± 4.70, p<0.001); HDL (55 ±14 vs 57 ±14 mg/dl, p<0.05); triglycerides (122 ±79 vs 106 ±88 mg/dl, p<0.01) and fasting blood glucose (98 ±12 vs 95 ±10 mg/dl, p< 0.001). After logistic regresión the co-variables associated independently with HT were age and sATS (both with p<0.001), resulting HOMA with borderline significance (p: 0.058).

	HT (n: 600)	No HT (n: 443)	*p value*
sATS	30% (95% CI: 26-35%)	9% (95% CI: 7-13%)	< 0.001
Infl.	34% (95% CI: 30-38%)	25% (95% CI: 21-30%)	< 0.01
Ins.Res.	38% (95% CI: 34-42%)	28% (95% CI: 24-33%)	< 0.01

Conclusions: Carotid US assessment allowed modifications in risk category of 3/10 patients with hypertension and showed the high prevalence of subclinical atherosclerosis in this patient population. We also observed that hypertension was independently related with age and subclinical atherosclerosis.

PP.44.13 ARTERIAL STIFFNESS IN HYPERTENSIVE WOMEN WITH LOW LEVELS OF VITAMIN D3

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Objective: Vitamin D is an independent predictor of cardiovascular disease and mortality from all causes.
The optimal concentration of 25 (OH) D3 in the blood should be approximately 30 ng / mL. Hypovitaminosis D is highly prevalent in Western populations adults. The discovery that many tissues and cells express receptors for vitamin D has opened new fields of research about its role in a variety of chronic diseases . In vitro, the active form of vitamin D has been shown eg by increasing vascular protective effects . the activity of NO. In addition, higher concentrations of Vitamin D have been associated with lower concentrations of plasma renin activity in hypertensive patients. Tomaschitz et al. showed an inverse relationship between renin, Ag II and vitamin D.
Two prospective studies have reported the association between baseline levels of Vit D and incidence of hypertension .
The aim of our study was to evaluate the correlation between hypovitaminosis D and PWV in a group of hypertensive women.

Design and method: We enrolled 52 hypertensive women and we divided depending on the values of Vit D3 into two groups. In both groups we performed the study of clinical artery stiffness.

Clinical caracteristics:

Low value Vit D3:	Normal value Vit D3:
Age m: 56.73 y	Age m: 52, 84 y
SBP mean 132.65 mmHg	SBP Mean: 131.54 mmHg
DBP mean 79.26 mmHg	DBP mean: 80.21 mmHg
PWV mean 11.61 m/s	PWV mean: 9.81 m/s
Vit D3 mean 14.86 ng/Ml	Vit D3 mean: 29.1 ng/mL
(deficiency <20, insuff 20-29, sufficiency > 29)	

Results: Our work has shown that, for the same values of brachial blood pressure , patients with low levels of vitamin D3 have a greater arterial stiffness expressed as PWV that we know to be an independent predictor of cardiovascular risk.

Conclusions: The evaluation of vitamin D levels should be performed in all patients with hypertension. What remains is to evaluate whether oral supplementation of vitamin D could influence arterial stiffness.

PP.44.14 ARTERIAL HYPERTENSION INFLUENCE UPON POSTINFARCTION ISCHEMIC CARDIOMYOPATHY IN THE PATIENTS WITH NAFLD AFTER CORONARY REVASCULARIZATION

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Objective: To study influence of essential hypertension (EH) upon post-infarction ischemic cardiomyopathy development in the patients with non-alcoholic fatty liver disease (NAFLD) after coronary revascularization.

Design and method: Patients' after AMI preparing for CABG surgery case histories were retrospectively analysed. According to EchoCG and abdominal US data all patients were divided into 4 groups: 1) pts. with severe LV systolic dysfunction (EF <=35%) + NAFLD (61 pts.); 2) pts. with moderate LV systolic dysfunction (EF >35%) + NAFLD (64 pts.); 3) pts. with severe LV systolic dysfunction (EF <=35%) without NAFLD (64 pts.); 4) EF >35% without NAFLD (60 pts.). Pts. with known alcohol abuse history, viral hepatitis or cirrhosis were excluded from the study. There were 90,2% of men and 9,8% of women in mean age of 58,7±7,6 years.

Results: It was found that EH was mostly often found in the patients of group 2 - 58 pts. (90,63%), and group 4 - 54 pts. (90,0%), along with the least proportion of those in group 3: 41 (64,52%) pt. Accordingly, pts. in groups 2 and 4 had thicker LV walls, especially IVS: 1,26±0,22 cm and 1,23±0,22 cm, respectively. Patients in groups 1 and 3 had normal wall thickness values (1,05±0,23 cm and 1,06±0,25 cm, respectively), but significantly lower LV EF values: 28,46±5,03

and 28,32±4,46, respectively, compared to groups 2 and 4: 48,97±9,11 and 47,10±8,62, p<0,001. LVPW thickness significantly differed only in patients without NAFLD groups: 1,06±0,21 vs. 1,16±0,18, p<0,01 (see table).

	EF >35%) + NAFLD (n=61)	EF >35% + NAFLD (n=64)	EF >35%) without NAFLD (n=64)	EF >35% without NAFLD (n=60)
LV EF, %	28,46±5,03	48,97±9,11	28,32±4,46	47,10±8,62
EH	45 (73,77%)	58 (90,63%)	41 (64,06%)	54 (90,0%)
IVSd, cm	1,05±0,23	1,26±0,22	1,06±0,25	1,23±0,22
LVPW, cm	1,12±0,21	1,2±0,21	1,06±0,21	1,16±0,18

Conclusions: LV hypertrophy due to EH may serve as a factor contributing to ischemic post-infarction cardiomyopathy prevention, especially in the patients without NAFLD.

PP.44.15 FAMILY HISTORY OF PREMATURE CARDIOVASCULAR EVENTS AND CAROTID TOTAL PLAQUE AREA

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Objective: Although a positive family history for premature cardiovascular events has been considered a risk factor for decades, it has not been incorporated along with other established risk factors such as hyperlipidemia, hypertension, and cigarette smoking in daily clinical practice when physicians evaluate the cardiovascular risk of a patient. One reason may be the presence of multiple risk factors coexisting during these evaluations.
The objective of this research was to investigate if patients with a family history of premature cardiovascular events have higher carotid total plaque area than patients without it, in the absence of other classical risk factors.

Design and method: Patients from the primary prevention database of Blossom DMO program were identified to have positive family history of premature cardiovascular events (FHPCVE). After apply excluding criteria (absence of any classical risk factor) 23 patients qualified. A control group was generated reaching same data in variables (blood pressure, age, body weight, LDL cholesterol), except carotid total plaque area which was reported at the end of groups formation, once both groups were formed. We used the same definition as the Framingham study (family history of <55 years in men and <65 years in women, first degree relatives) to consider a patient with FHPCVE.

Results: The group with FHPCVE was similar to the control group. Age 59±2 vs. 60±1 yo, blood pressure 126±2/75±1 mmHg vs 127±1/74±1 mmHg, body mass index, 23±1 vs 24±1 Kg/cm²; they had a lower LDL cholesterol 116±15 vs 139±20 mg/dl (p<0.05). Despite lower LDL levels, patients with FHPCVE had a higher TPA: FHPCVE 49±8 mm² vs. controls 33±4 mm² (p<0.05). Framingham risk scores were similar, while the post-test risk of myocardial infarction (incorporating TPA) was lower in controls (16±1% vs 20±3%, p<0.05).

Conclusions: Our data indicates that patients with positive family history for premature cardiovascular events have a higher plaque burden, indicating increased risk of a cardiovascular event, even in the absence of other classical risk factor. Physicians should identify these patients early and treat them to prevent arterial deterioration.

PP.44.16 ISOLATED DIASTOLIC HYPERTENSION: POSSIBLE UNDERLYING MECHANISMS OF ITS DEVELOPMENT

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Objective: We examined whether the increased arterial stiffness and/or abnormal central hemodynamics are related to the development of isolated diastolic hypertension (iDiaHyp).

Design and method: In 1268 Japanese men without hypertension (43 ± 8 years old), the relationships of radial augmentation index (rAI) and brachial-ankle pulse wave velocity (baPWV) measured at the first examination with the presence of the iDiaHyp at the second examination (after 3 years' follow-up) were examined.

Results: Among these 1268 men, hypertension was detected at the second examination in 154 men (138 men were not under anti-hypertensive medication). Among these 138 hypertensive subjects without anti-hypertensive medication, 58 subjects were defined as iDiaHyp. At the initial of this follow-up period, while rAI and baPWV were higher in subjects with the development of hypertension (n=154) than in those without the development of hypertension (n=1114), both values were similar between hypertensive subjects with iDiaHyp (n=58) and those without iDiaHyp (n=80). Furthermore, the rAI and baPWV were significantly increased not only in hypertensive subjects without iDiaHyp but also in those with iDiaHyp (p<0.05). The change of baPWV during the study period was larger in hypertensive men without iDiaHyp (147±111 cm/sec) than that in men with iDiaHyp (89±112 cm/sec)(p=0.003). However, the change of rAI during the study period was similar between both groups (3.2±10.3 vs. 3.9±8.3 %, p=0.762).

Conclusions: While arterial stiffness was increased and central hemodynamics were augmented along with the development of hypertension, the extent of increase in arterial stiffness might be smaller in subjects with iDiaHyp than in those without iDiaHyp. This difference might be one of underlying mechanisms in the development of iDiaHyp.

PP.44.17 IMPACT OF CAROTID PULSE WAVE VELOCITY IN EVALUATION OF TOTAL ATHEROSCLEROTIC BURDEN

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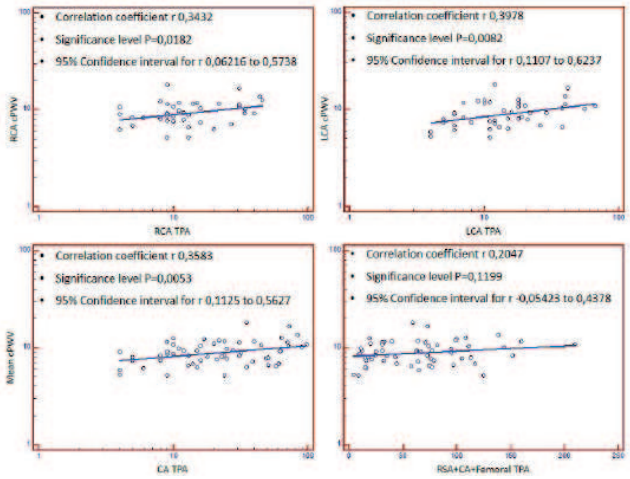
Objective: Subclinical atherosclerosis is currently considered as target organ damage (TOD), and it is associated with a higher risk of stroke and other cardiovascular events. Presence of an elevated pulse wave velocity (PWV) also increase cardiovascular risk. Carotid pulse wave velocity (cPWV) is related to arterial stiffness, but it has not been related to the atherosclerotic burden.
To determine whether cPWV is associated to local (carotid arteries - CA) or to total atherosclerotic burden (brachiocephalic trunk, right subclavian artery, carotid and femoral arteries).

Design and method: A cohort of 75 consecutive hypertensive patients were evaluated, from a cardiovascular primary prevention program. On a systematic approach, we evaluated sequentially (vascular ultrasound, 10 MHz probe), the brachiocephalic trunk and right subclavian artery (BT/RSA), both carotids (common/internal/external), and both femoral arteries (main/superficial/deep), following Mannheim Consensus criteria for plaque definition; cPWV and cIMT measurement (QAS/QIMT Esaote MyLab 60); and carotid-femoral tonometric PWV. Total plaque area (TPA) was also determined in every arterial location (plaque area in mm2).



Results: 60 patients with presence of plaque were included (57.6 ±10.9y, 65% male, SBP/DBP 141.8 ±18.2/84.4 ±10.3 mmHg). Mean cPWV was significantly associated with mean cIMT (r 0,5251; p<0,0001) and with bilateral carotid TPA (r 0,3583; p=0,0059), but not with total atherosclerotic burden (r 0,2047;

p=0,1199). Moreover, homolateral cPWV and carotid TPA were significantly associated, in right CA (r 0,3432; p<0,0001) as in left CA (r 0,3978; p=0,0082).

Conclusions: Carotid pulse wave velocity is related to arterial stiffness, and in this group of hypertensive patients was significantly associated with local atherosclerotic burden in carotid arteries, but not to total atherosclerotic burden when plaques were present in other artery locations.

PP.44.18 ATHEROSCLEROTIC BURDEN IS UNDERESTIMATED IN HYPERTENSIVE PATIENTS

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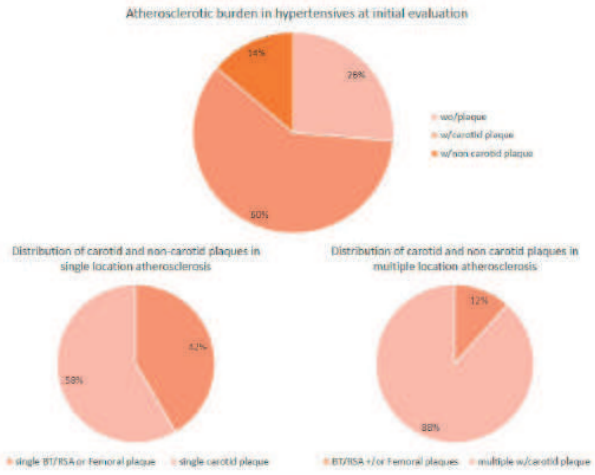
Objective: Atherosclerotic burden has been largely related to higher cardiovascular morbidity and mortality, in primary as secondary prevention, although it has not a specific definition. However, its prevalence is higher in those with major cardiovascular risk factors. Current guidelines in hypertension management recommend atherosclerosis screening only in carotid arteries, in the evaluation of target organ damage (TOD), with no recommendation of screening other arterial locations. This procedure could underestimate the prevalence of atherosclerosis in hypertensive patients.
To determine the total atherosclerotic burden in hypertensive patients, and to compare diagnostic effectiveness of a single (carotid arteries) versus a multiple location (other territories) arterial evaluation strategy.



Design and method: 4271 hypertensive patients (53.5 ±12.5 years, 67% male, SBP/DBP 141 ±17.9/86.5 ±10.3 mmHg) were included. Through a systematic approach of TOD evaluation, we sequentially have evaluated (ESAOTE MyLab40, 10MHz probe) the brachiocephalic trunk and right subclavian artery (BT/RSA), both carotid arteries (common/internal/external), and both femoral arteries (main/superficial/deep), following Mannheim Consensus criteria for plaque definition. Total plaque area (TPA) was also determined in every arterial location (plaque area in mm2).

Results: Prevalence of plaque identification was 73.7% (24% single plaque location; 76% multiple location). Single plaque location was observed in 755 subjects (10.7% BT/RSA, mean TPA 20.1mm2; 58.4% carotid, TPA 11.9mm2; and 30.9% femoral arteries, TPA 22.2mm2). Multiple plaque location was observed in 76% (88.4% with carotid involvement, 11.6% without carotid plaques).

Conclusions: Atherosclerosis was present in almost three out of four hypertensive patients when several arterial locations were screened. Other locations of plaques than carotid arteries were identified in almost a half of those with single plaque identification, while only 10% of those hypertensive patients with multiple plaques had no one in carotids. Screening for plaque in other locations than just the carotid arteries could increase the effectiveness in the detection of subclinical atherosclerosis in hypertensive patients.

PP.44.19 DRINKING CITRUS FRUITS INHIBITS VASCULAR REMODELING IN CUFF-PLACEMENT MOUSE MODEL

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Objective: Dietary habits are closely related to most lifestyle-related diseases. According to the epidemiological studies, citrus fruits are expected to have inhibitory effects on oxidative stress, thereby attenuating the onset and progress of cancers or cardiovascular diseases; however, there are few reports assessing their efficacy on vascular remodeling. Accordingly, we investigated the role of various drinking citrus fruits in vascular neointima formation using cuff-induced vascular injury mouse model.

Design and method: Male C57BL6 mice were divided into 5 groups as follows: 1) Control (water) (C), 2) 10% Citrus Unshiu (CU) (CU10), 3) 40% CU (CU40), 4) 10% Citrus Iyo (CI) (CI10), 5) 40% CI (CI40) drinking. After drinking them for 2 weeks from 8 weeks-old, cuff injury was induced by polyethylene cuff placement around the femoral artery. Neointima formation was evaluated by elastica van Gieson staining 2 weeks after cuff-placement. One week after cuff-placement, vascular samples were prepared and subjected to study the various parameters as follows. Inflammatory cytokine levels, superoxide anion production, cell proliferation, and expression of extracellular signal-regulated kinase (ERK) were assessed by RT-PCR, dihydroethidium staining, proliferating cell nuclear antigen staining and immunohistochemistory respectively.

Results: Neointima formation was significantly attenuated in CU40, CI10 and CI40 compared with C; however, no remarkable preventive effect was observed in CU10. The increases in various inflammatory markers including cytokine levels such as interferon regulatory factor-1, monocyte chemotactic protein-1, interleukin-6 (IL-6), IL-1β and tumor necrosis factor-α in response to vascular injury did not differ significantly between C, CU10 and CI10, but decreased in CU40 and CI40. However, the increase in superoxide anion production, cell proliferation and expression of phosphorylated ERK were remarkably attenuated in CI10, CI40, CU40, but not in CU10 compared with C.

Conclusions: These results indicate that drinking citrus fruits attenuate vascular remodeling partly via the reduction of oxidative stress and proliferative signaling. Interestingly, preventive efficacy of neointima formation was stronger in CI compared with CU. We are now investigating the detailed mechanism of their difference focusing on containing compositions.

PP.44.20 CROCIN TREATMENT REDUCES ATHEROSCLEROSIS IN APOE KNOCKOUT MICE BY AFFECTING ENOS AND HIF-1A EXPRESSION

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Objective: There are several studies indicating that crocin has hypolipidemic and antiatherosclerotic properties. We have previously shown that crocin treatment results in reduction of atherosclerotic lesions in ApoE knockout mice, without significantly affecting the plasma lipid profile.
To determine the mechanism of the antiatherosclerotic effect of crocin in ApoE knockout mice.

Design and method: Crocin was administered to the mice at a dose of 100 mg/kg in the drinking water. Sixty two (62) animals were used in the present study, divided in four groups as follows: thirty one (31) animals (17 M and 14 F) were given crocin whereas 31 animals (17 M and 14 F) were used as Controls. The mice were purchased from the Jackson Laboratory, USA and were maintained on a standard chow diet containing 5% fat. Drug treatment was initiated at the 16th week of age, and the animals were maintained for 16 additional weeks on the designated treatment. At 32 weeks of age the proximal aorta was removed for atherosclerosis area measurement and sections of 3μm were used to determine the expression of eNOS and HIF-1a by immunohistochemistry. ANOVA and 2-tailed unpaired Student's t test were used for statistical analysis and all values are expressed as Mean±SEM.

Results: As previously shown, crocin reduced atherosclerosis area (mm2) in both male and female mice compared to controls [Male] (Crocin:0.079±0.01 vs Control:0.191±0.03, p=0.002) – [Female] (Crocin:0.098±0.02 vs Control:0.176±0.02, p<0.03), without significantly affecting the plasma lipid profile of treated animals. eNOS expression was significantly increased in crocin treated mice [Male] (Crocin:2.786±0.239 vs Control:1.500±0.342, p=0.004) – [Female] (Crocin:3.500±0.522 vs Control:1.167±0.441, p=0.003), while HIF-1α expression was significantly decreased in crocin treated male and female mice compared to Controls (21.25±2.14 vs. 155.5±6.67, p<0.001).

Conclusions: Crocin treatment results in reduction of atherosclerotic lesions in ApoE knockout mice, by significantly affecting eNOS and HIF-1a expression at the atherosclerosis area.

PP.44.21 OMEGA-3 POLYUNSATURATED FATTY ACIDS IN HYPERTENSIVE POSTMENOPAUSAL WOMEN

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Objective: To asses erythrocyte membrane lipids fatty acids composition in hypertensive and normotensive postmenopausal women.

Design and method: 203 women with surgical and natural menopause were included in the investigation: the 1st group - 88 hypertensive patients (average age 43,2±2,7 years, menopause duration 4,3±2,1 years); the 2nd group - 115 normotensive women (average age 47,3±5,4 years, menopause duration 4,8±5,4 years). 35 healthy women were included in the control group. All patients underwent general clinical examination, body mass index (BMI) calculation, measurement of waist circumference, menopausal index evaluation, ambulatory blood pressure and electrocardiogram monitoring (Cardiotens-01, Meditech, Hungary), determination of general cholesterol, lipid fractions and glucose tolerance. We also assessed the proportion of different fatty acids in erythrocyte membranes. Statistical methods such as Cruskell-Walles, Dan and Spyrmen correlation criteria were used.

Results: All patients in menopause had expressed changes in fatty acids composition of erythrocyte membranes in comparison with healthy women: saturated acids relative content was increased, and unsaturated acids relative content was decreased, especially in hypertensive women. The most serious deviations concerned omega-3 polyunsturated acids: relative contents of alpha-linoleic acid in patients of the 1st group was 3,1 times less than in control group ($P<0.001$); patients of the 2nd group demonstrated 2,8 times decrease of this index in comparison with healthy women ($P<0.001$). The content of eicosapentaenoic acid in the 1st and the 2nd groups was 42% and 27% less than in control group, relatively ($P<0.01$). The same changes in the 1st and the 2nd groups were enrolled to docosapentaenoic and arachidonic acids: they were 3 - 2,1 times less and 2,8 - 2,4 times less than in healthy women, relatively ($P<0.001$). Main parameters reflecting arterial hypertension severity in postmenopausal women correlated negatively with alpha-linoleic, eicosapentaenoic acid content and common polyunsturated acids content (correlation coefficients from -0.32 to -0.58, $P<0.001$).

Conclusions: Postmenopausal women, especially suffering with arterial hypertension, have severe changes in fatty acids composition of erythrocyte membranes. This fact may reflect the role of detected disturbances in target organ damage and atherosclerosis progression in postmenopausal women.

PP.44.22 EFFECTS RESVERATROL VS ROSUVASTATIN ON LIPID PROFILE IN PATIENTS WITH ESSENTIAL HYPERTENSION

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Objective: Evaluation of the effect of resveratrol compared with rosuvastatin on lipid profile in patients with essential hypertension.

Design and method: We included 73 patients (age 55,6±1,5 years). All patients were examined: physical examination, serum biochemistry, office measurement BP, ambulatory BP monitoring.
All patients were treated with standard antihypertensive therapy. Patients were divided into two groups: I group (n=38) rosuvastatin 20 mg, after 1 month 50 mg resveratrol was added. II group (n=35) resveratrol 50 mg, afte month 20 mg rosuvastatin was added. Follow-up of 2 months.
Level of total cholesterol patients I group was 6,3±0,2 mmol/l, after one month of observation-5,1±0,1 mmol/l, two months 4,6±0,1 mmol/l. Level of HDL changed as: 1,30±0,04/1,40±0,02/1,5±0,03 mmol/l, respectively. Level of LDL changed as 3,7±0,1/2,9±0,1/2,7±0,1 mmol/l, respectively. Level of the TG changed as 1,8±0,2/1,5±0,1/1,4±0,1 mmol/l, respectively.
In II group level of total cholesterol in the early follow-up was 6,8±1,2 mmol/l, a month-5,0±0,1 mmol/l, in two months-4,6±0,1 mmol/l. Level of HDL changed as: 1,4±0,04/1,5±0,04/1,9±0,4 mmol/l, respectively. Level of LDL changed as: 3,6±0,2/3,0±0,1/2,7±0,1 mmol/l, respectively. Level of TG changed so: 1,4±0,2/1,2±0,1/1,2±0,1 mmol/l, respectively.

Results: After analisys we noted that in resveratrol group afte one month level of total cholesterol decreased by 26,5%(δ-1,8)(p=0,07;r=0,136), two months another 8%(δ-0,4) (p=1,6;r=0,793), decreased all period was 32,4%(δ-2,2) (p=0,03;r=0,132). The level of TG decreased by 14,3% (δ-0,2) (p=0,03;r=0,854) after a month. Level of HDL increase 7,1%(δ+0,1) (p=0,003;r=0,663)/26,7% (δ+0,4) (p=0,13;r=0,242)/33,3% (δ+0,5) (p=0,08;r=0,197), respectively. Level of LDL decreased by 16,7% (δ-0,6) (p=1,56;r=0,746)/10% (δ-0,3) (p=2,03;r=0,864)/25% (δ-0,9) (p=1,95;r=0,618), respectively.
In rosuvastatin group a month observation a decrease in total cholesterol by 19%(δ-1,2) (p=0,943;r=0,552), after two monthes 7,9% (δ-0,5) (p=0,249;r=0,755), decreased all period was 30%(δ-1,7) (p=0,429;r=0,424). Level of TG decreased by 16,6%(δ-0,3) (p=0,004;r=0,805)/6,7% (δ-0,1) (p=0,02;r=0,81)/22,2% (δ-0,4) (p=0,0003; r=0,770), respectively. Level of HDL increase 7,7%(δ-0,1) (p=0,005;r=0,477)/7,7% (δ-0,14) (p=1,6;r=0,549)/15,4% (δ-0,002) (p=1,6;r=0,348), respectively. Level of LDL decreased by 21,6% (δ-0,8) (p=2,08;r=0,552)/7% (δ-0,2) (p=0,21;r=0,756)/27% (δ-1) (p=0,44;r=0,786), respectively.

Conclusions: We observed effective reduction LDL, total cholesterol, TG and increase HDL in patients with essential hypertension receiving as resveratrol, as rosuvastatin. But more than significant decrease of these parameters, we noted in group of resveratrol.

PP.44.23 HYPERHOMOCYSTEINEMIA IS A RISK FACTOR FOR CEREBROVASCULAR STIFFNESS IN HYPERTENSIVE PATIENTS, ESPECIALLY ELDERLY MALES

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Objective: Hyperhomocysteinemia is an independent risk factor for cardiovascular disease, especially stroke. The resistive index (RI) calculated using carotid flow velocity reflects a downstream arterial resistance and a risk of cerebral infarction.

Design and method: We measured serum homocysteine levels and performed carotid artery ultrasound and measured carotid RI in 261 patients with essential hypertension. The patients were divided into two groups according to their serum homocysteine level.

Results: The high homocysteine group (>=10 mol/L) had a lower eGFR ($p<0.001$) and higher uric acid level ($p<0.001$) and carotid resistive index (RI) ($p=0.001$) than the low homocysteine group. A higher RI indicates more advanced cerebrovascular stiffness. Carotid RI was associated independently with age and homocysteine level. The patients were stratified further according to age (<65 yr or >=65 yr) and gender, and the relationship between homocysteine and carotid RI then examined. Carotid RI was increased in the high homocysteine group compared with the low homocysteine group only in elderly males. Multiple regression analysis showed that serum homocysteine level was an independent determinant of carotid RI.

Conclusions: These results suggest that hyperhomocysteinemia is a risk factor for cerebrovascular stiffness in hypertensive patients, especially elderly males.

PP.44.24 EVOLUTION OF RENOVASCULAR ATHEROSCLEROSIS: A HISTOPATHOLOGICAL HYPOTHESIS

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Objective: Renovascular Atherosclerosis (RA) leading complications are severe hypertension (HT) and end stage renal disease (ESRD). However pathogenesis of the renal damage is not fully understood, being attributed to the interactions of different factors like RAAS, nefrosclerosis, ischemia, HT. Although diagnosis of RA is frequently done at its symptomatic phases (HT-ESRD), we thought that evaluation of its histopathological characteristics in asymptomatic phases could contribute to its better understanding. AIMS: to develop a histopathological characterization of asymptomatic RA and analyze its potential role in ESRD.

Design and method: We evaluated 139 subjects died due to suicide, murderer or accident consecutively admitted for autopsy (Judicial Morgue, Buenos Aires). To be included subject must have asymptomatic renovascular atherosclerosis with a unilateral plaque < 40% stenosis, plus mild HT and normal renal function when alive. A final population of 42 subjects were included after applying exclusion criteria (cardiovascular events, renal function impairment). We classified them in a) group RA (atherosclerotic renal plaque n: 21) b) group NA (normal renal arteries n: 21). Vessel specimens were fixed (IHC-Zinc, BD Biosciences Pharmingen) obtaining 4 μm sections, analized with HE, P.A.S. and Masson by two blinded expert. Atherosclerosis stage was defined according to AHA classification and Virmani.

Results: A high prevalence-71%- of plaques in AHA's Vc was observed, while 24 % were in stage IV 24%, 5% VIb 5%. Characteristics of histopathological findings are shown in table.

Adventitial neovascularisation	18
T Cell in cumulies	15
Reticular Fibrosis	14
Elastic laminae fragmentation	6
Intraplaque hemorraghe	4
Elastic fibras	4
T cells dissemination	4
Endothelial disruption	3
Nuclear necrosis	2
Lipid nucleo	2
Thrombosis areas	2

Table. Histophatological findings in asymptomatic renal atherosclerotic plaques.

Conclusions: Advanced stages of atherosclerosis were found in asymptomatic renal plaques, suggesting a clinical- physiopathological dissociation phenomena. A intense neovascularisation provide a favorable environment for plaque nutrition and grow although in this early clinical phases. Plaque characteristics could lead to tromboembolization and immunoinflammatory activation as relevant mechanisms for ESRD.

PP.44.25 PRESENCE SUBCLINICAL CAROTID AND PERIPHERAL ARTERIAL DISEASE IN PATIENTS WITH ARTERIAL HYPERTENSION

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Objective: Ankle-brachial index (ABI) and carotid intima-media thickness (CIMT) are non-invasive markers of early atherosclerosis and allow the detection of a subgroup of patients at a high level of cardiovascular risk.
The aim of study was to determine presence subclinical carotid and peripheral arterial disease in patients with arterial hypertension (AH).

Design and method: The study enrolled 184 examinees divided into three groups. The first (I) group consisted of patients with AH and coronary artery disease (CAD), N=80, the second (II) group were patients with AH without CAD, N=54 and the third control group (III) were healthy examinees without AH, N=50. For all patients there was determined: risk SCORE, laboratory analyses, ABI, color doppler sonography of the carotid arteries.

Results: Cardiovascular risk SCORE was significantly higher in patients with AH (p<0,0001). The value of the ABI in patients with AH and CAD was the lowest (0,99±0,21) and significantly lower than in the second and third group (I vs II p<0,001, I vs III p<0,0001, II vs III p=0,01). Abnormal values ABI were found in 62.5% of patients, 46% <= 0.9, 16% >= 1.3. The value of the CIMT in patients with AH and CAD was the highest (1,01±0,19) and significantly higher than in the second and third group (I vs II p<0,0001, I vs III p<0,001, II vs III p=0,01). Carotid plaques were found in 69 (86%) of patients from the first group (vs.28 (51,85%) in the second and 6 (12%) in the third group), I vs II p<0.001, I vs III p< 0.001, II vs III p< 0.001). Carotid stenosis >= 50 % had 21% of patients in the first groups (vs. 5,5% in II , 0% in III group). They had a higher average number of carotid plaques (I vs II p <0,0001, and vs III, p< 0,0001) and percentage of stenosis. Abnormal values for both, ABI and CIMT, had 37(46%) examinees of the first and 6(11%) of the second group, p<0.001.

Conclusions: Ankle-brachial index and CIMT reveal a significant incidence carotid and peripheral arterial disease in patients with AH and CAD.

PP.44.26 THE CORRELATIVE ANALYSIS WITH ARTERIAL STIFFNESS, CAROTID IMT AND AORTIC VALVE SCLEROSIS IN HYPERTENSIVE PATIENTS WITH CORONARY ARTERY DISEASE

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Objective: The purpose of this study was to examine the relationship between carotid intima-media thickness (carotid IMT), aortic valve sclerosis (AVS) and indices of arterial stiffness, including pulse wave velocity (PWV) and augmentation index (AIx) in hypertensive patients with suspected coronary artery disease (CAD).

Design and method: The study included 44 patients who were scheduled to undergo coronary angiography (25 males, 19 females, mean age 64.9) in hypertensive patients with suspected coronary artery disease. Carotid IMT and AVS measurements were done using high resolution ultrasound machine. PWV was measured using PP-1000 (Hanbyul meditech) at carotid, radial, femoral and dorsalis pedis arteries on supine position. So we got the three PWV including aorta, leg and arm. AIx of peripheral pressure and central pressure were measured using GAON 21A (Hanbyul meditech) at radial artery.

Results: Of the 44 patients, 25 patients (56.8%) were diagnosed as having CAD on coronary angiography. All patients had AVS. A relatively good correlation was obtained between the presence of the carotid IMT and PWV of the upper arm (p=0.009). There was a significant correlation between the presence of the CAD and PWV of the upper arm (P=0.05) and lower leg (P=0.039), and also Aix (peripheral AIx, P=0.041, central AIx, p=0.021). There were no correlation between the severity of CAD and AVS (P=0.322), the presence of CAD and the carotid IMT (meanIMT P=0.234, maxIMT P=0.299). But according to the severity of CAD, it seemed to have a tendency to increase the carotid IMT.

Conclusions: Of the four non-invasive methods, PWV, AIx and AVS may be considered as useful clinical markers for determining coronary artery atherosclerosis in hypertensive patients. Therefore there is association between the presence of the CAD and arterial stiffness in hypertensive patients.

PP.44.27 IS GLYCATED HEMOGLOBIN LEVEL AND SUBCLINICAL ATHEROSCLEROSIS RELATED IN NON-DIABETIC INDIVIDUALS?

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Objective: The purpose of this study was to analySe the relationship between glycated hemoglobin A1 (HbA1c) levels and subclinical atherosclerosis assessed by carotid intima-media thickness (IMT), presence of carotid plaque (CP) and pulse wave velocity (PWV) in patients without diabetes.

Table. OR for plaque presence according to HbA1c level

HbA1c Level (%)	Univariate OR	*p* value	Multivariate OR	*p* value
HbA1c <5.5% (n=54)	1		1	
5.5≤HbA1c<6.0 (n=113)	2.360 (1.16-4.80)	0.018	1.775 (0.74-4.27)	0.201
6.0≤HbA1c<6.5 (n=47)	3.636 (1.38-9.61)	0.009	1.853 (0.59-5.79)	0.289

Data are relative odds (95% CI), Multivariate analysis adjusted for age, height, HTN, Previous PCI.

Design and method: From January 2011 through December 2012, carotid IMT and CP presence were evaluated in 214 non-diabetes patients (118 male, 96 female) with measurement of HbA1c, ankle-brachial index (ABI), brachial/femoral and heart to femoral PWV. HbA1c level was categorized into 3 groups (<5.5%, 5.5% to 5.9%, and 6.0% to 6.4%).

Results: Baseline characteristics were similar between three groups except age. There were no significant linear trends between groups either in PWV and carotid IMT measurement; however, the presence of CP showed significant linear trend (P for trend= 0.004). Odd ratios (ORs) of univariate model for presence of CP was 2.36 and 3.6 in the middle (5.5<= HbA1c<6.0) and highest HbA1c (6.0<=HbA1c<6.5) group compared with the lowest group (HbA1c <5.5%) (p=0.018 and p=0.009, respectively). Sub-analysis of 115 non-diabetic patients (57 male, 58 female) with hypertension showed poor agreement in linear increase of carotid IMT, PWV measurements and plaque presence according to the elevation of HbA1c level which the result might have been influenced by other factors.

Conclusions: Carotid IMT and PWV in non-diabetic individuals had poor correlation with HbA1c level; however, there was a significant linear relation between three groups in presence of CP.

PP.44.28 ATHEROSCLEROSIS IN DESCENDING THORACIC AORTA MIGHT BE INDEPENDENTLY RELATED WITH CORONARY ARTERY DISEASE ON COMPUTED TOMOGRAPHY CORONARY ANGIOGRAPHY

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Objective: Computed tomography coronary angiography (CTA) is a well-established modality for the evaluation of coronary artery disease (CAD) and also permits visualization of the descending thoracic aorta (DTA). Atherosclerosis in the DTA, a marker of diffuse atherosclerotic cardiovascular disease, is frequently observed, and, various imaging techniques have demonstrated the association between DTA atherosclerosis CAD. The aim of this study was to assess associations between DTA atherosclerosis and CAD.

Design and method: The study was a retrospective analysis of the findings in 237 patients performed CTA for evaluation of suspected CAD at our single center in the period between February 2006 and December 2008. The patients with history of CAD or coronary revascularization were excluded. In DTA analysis of CTA, the presence of atherosclerotic plaque was defined as wall thickness >,=2 mm in at least one DTA segment. In CAD analysis of CTA, the presence of atherosclerotic plaque and severity of luminal stenosis were determined from CTA. For each segment, the severity of luminal stenosis was visually scored as follows: non-significant CAD (<50 % stenosis) and significant CAD (>,=50 % stenosis).

Results: The patients were 107 men and 130 women (45:55%) with mean age of 66 years. The incidences of diabetes, hypertension, smoking and hyperlipidemia were 27.0% (n=64), 43.0% (n=102), 28.7% (n=68) and 34.2% (n=81), respectively. The incidences of DTA plaque, DTA calcification and significant CAD were 60.3% (n=143), 67.5% (n=160) and 47.7% (n=113), respectively. The incidences of DTA plague (significant CAD vs non-significant CAD, 76.1% vs 46.0%, p=0.032) and calcification (significant CAD vs non-significant CAD, 74.3% vs 61.3%, p=0.032) were significantly higher in significant CAD. In multivariate analysis after adjustment of CAD associated factor including age, sex, diabetes, hypertension, smoking, hyperlipidemia, renal function, ejection fraction and DTA calcification, DTA plaque is the independent predictor of significant CAD (HR: 3.6, 95% CI: 1.9-6.9, p<0.001).

Conclusions: The presence and severity of DTA atherosclerosis might be independently related with CAD on CTA.

PP.44.29 RELATIONSHIP BETWEEN ALCOHOL CONSUMPTION AND SERUM LIPID PROFILES AMONG MIDDLE-AGED POPULATION OF CHINA: A MULTIPLE-CENTER CARDIOVASCULAR EPIDEMIOLOGICAL STUDY

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Objective: We assessed the relationships between alcohol consumption and serum lipid levels among middle-aged Chinese population.

Design and method: Across-sectional survey on risk factors of cardiovascular disease was conducted in 2009-2010. There were 10154 (85.94%) participants were eligible for analysis. Self-reported lifestyle and clinical risk factors were collected using a questionnaire, and fasting serum lipid levels were measured.

Results: The overall prevalence of drinking is 34.07 % in male, 3.61% in female. Heavy alcohol drinkers (>= 30g per day) tended to be older, smoker, hypertensive, heavy physical activity and lower body mass index. High-density lipoprotein cholesterol level, apolipoprotein A1 level, low-density lipoprotein cholesterol / high-density lipoprotein cholesterol ratio and apolipoprotein B / apolipoprotein A1 ratio increased with the alcohol intake increase in both gender. An increase of 0.269 mmol/L triglyceride and decrease 0.269 mmol/L lipoprotein(a) were observed for male alcohol drinkers who consumed >=30 g alcohol per day compared with abstainers after controlling for all confounders. Additionally, an increase of Lipoprotein(a) level with the alcohol intake increase was observed in female.

Conclusions: Total cholesterol, high-density lipoprotein cholesterol and apolipoprotein A1 levels increased with the alcohol intake increase in both gender, and the lipoprotein(a) decreased with the alcohol intake increase in male. However, these associations in female still need further investigated.

PP.44.30 AGE AND DURATION OF HYPERTESNION ARE THE MOST POWERFUL RISK FACTORS FOR DEVELOPMENT OF SUBCLINICAL ATHEROSCLEROSIS

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Objective: During the last two decades, carotid ultrasound has been established as a screening tool for detection of subclinical atherosclerosis. Many studies have found statistically significant correlation between carotid intima- media thickness (IMT) and coronary artery disease and cerebro-vascular disease. That is why the IMT above 0.9 mm, or presence of plaque in the carotid arteries are considered in the current Guidelines for management of hypertension to be markers of targed organ damage.
The aim of our study was to find the correlation between various risk factors and subclinical carotid atherosclerosis in a group of hypertensive patients.

Design and method: We studied 72 hypertensive patients (40 female and 32 male) at mean age of 59,46±9,51. They were asked about their awearness and duration of hypertension, diabetes and smoking. Fasting blood samples for glucose, total cholesterol, LDL, HDL, triglycerides, uric acid, CRP and SR were collected. Bilateral ultrasonografic examination of the carotid arteries was performed. Patients with signs and symptoms of coronary artery disease or heart failure, cerebro vascular disease, renal failure or peripheral artery disease were excluded from the study.

Results: The mean values of the IMT were: 0.84±0.14 mm fot the left common carotid artery and 0.83±0.14 mm for the right one. We also found presence of plaque in 22.2 % of the asymptomatic hypertensive patients.
The correlational analysis showed that age and duration of hypertension were the only quantitative parameters with statistically significant correlation with IMT.
We also performed a binary logistic regression analysis. And again the age and duration of hypertension were the only predictors of subclinical atherosclerosis (defined as IMT above 0.9 mm or presence of plaque).

Conclusions: In our relatively small study, age and duration of hypertension were the only independent predictors for development of subclinical carotid atherosclerosis. That may by one of the explanations why hypertension is the most powerful risk factor for stroke. The modern medicine still can't stop the natural process of aging, but at least can slow down the premature aging by early detection and proper treatment of hypertension.

PP.44.31 ANNEXIN A5 MAY COUNTERACT INCIPIENT ARTERIAL STIFFNESS AND ATHEROSCLEROTIC VASCULAR DISEASE IN TREATED HYPERTENSIVE PATIENTS

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Objective: It has been demonstrated that annexin A5 (AnxA5) is associated with atherosclerotic cardiovascular disease and endothelial dysfunction: it seems to attenuate vascular inflammation and improve vessel wall function and plaque integrity.
The aim of our study is to investigate possible relations between annexin A5 and arterial stiffness assessed by means of cf-Pulse Wave Velocity (PWV), indicative of vascular organ damage.

Design and method: We enrolled 175 consecutive grade 1 hypertensive patients with fairy controlled BP values (HT) and 175 healthy controls (C). First, we assessed AnxA5 relationship with clinical variables (age; heart rate, HR; systolic and diastolic blood pressure, SBP and DBP; BMI and PWV) in the whole population (Pearson R). Then we compared AnxA5 levels in patients with (OD, n 193) and without (NOD, n 155) vascular organ damage (i.e PWV>= 10 m/sec) (T student).
Afterwards we repeated the same division within HT and C obtaining four groups (HTOD, n 110; HTNOD, n 35; COD, n 57; CNOD, n 114;) in which we compared AnxA5 concentrations (ANOVA).

Results: On the whole population (n= 350, 55±15 years) we found a correlation between AnxA5 levels and PWV (p 0.04, r 0.10), SBP (p 0.03, r 0.11), HR (p 0.01, r 0.13) and age (p 0.01, r 0.13), while it was not correlated with DBP and BMI.
AnxA5 plasma levels were higher in OD than in NOD (12.5±9.7 vs 10.1±7.46 ng/mL, p-value 0.005). Moreover, AnxA5 plasma levels were higher in HT-NOD and HTOD compared with CNOD (14.2±10.9 and 13.2±10.2 vs 8.8±7.31, p<0.05) even after adjusting for age.

Conclusions: Our preliminary data show that AnxA5 levels have a relationship with arterial stiffness in hypertensive and healthy subjects. We can speculate that AnxA5 can be upregulated in treated hypertensive patients in an attempt to counteract incipient aortic stiffness that is indicative of initial atherosclerotic disease.

PP.44.32 CARDIOTROPHIN-1 IS AN EARLY BIOMARKER OF HYPERTENSION-INDUCED TARGET ORGAN DAMAGE

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Objective: Hypertension induces alterations in several organs that due to their susceptibility to this pathology are called target organs. The search of early biomarkers to detect the initial insult has been a priority in the last decade. We have analysed the role of cardiotrophin-1 (CT-1), a cytokine with hypertrophic effects in heart and other tissues, as a potential biomarker of hypertension-induced target organ damage.

Design and method: We have analysed 299 hypertensive patients and 99 healthy controls. We evaluate systolic (SP) and diastolic (DP) blood pressure continuously during 24 hours. Renal function was assessed by microalbuminuria and albumin/creatinine index. Retinopathy was evaluated by non-midriatic retinography with a validated software. Ankle-brachial index (ABI) was used to determine arterial stiffness. Serum CT-1 was analysed by ELISA.

Results: CT-1 serum levels are correlated with SP and DP, as well as with microalbuminuria and albumin/creatinine index. Higher CT-1 levels are also correlated with lower ABI levels, and with higher degrees of retinopathy in hypertensive patients.

Conclusions: Higher CT-1 levels in plasma are related with higher blood pressure levels and with target organ (kidney, vessels, retina) damage.

PP.44.33 RISK FACTORS, TARGET ORGAN DAMAGE AND CARDIOVASCULAR DISEASE ASSOCIATED WITH THE CARDIO ANKLE VASCULAR INDEX

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Objective: To analyse cardiovascular risk factors, target organ damage and associated clinical conditions, according to the 2013 European Society Hypertension Guidelines, and which of them are associated with the Cardio-Ankle Vascular index (CAVI).

Design and method: We performed a cross sectional study and included 503 subjects, aged 30 to 75 years (mean: 60.35 ± 8.44), 54.3% men, without cardiovascular diseases from the MARK study, selected by consecutive sampling from a Spanish health center. Measurement: Cardio Ankle Vascular index (CAVI) using the VaSera device (Fukuda Denshi). We used systolic blood pressure (SBP), as a quantitative variable, and cardiovascular risk factors (RF), target organ damage (TOD) and diabetes, cardiovascular or renal disease, as categorical variables, according the 2013 European Guidelines on Hypertension. Multiple linear regression analysis using the stepwise method was performed.

Results: The mean CAVI was 8.47±1.06; in men 8.48 ±1.10 and in women 8.44±1.01 (p>0.05). 33.7% were less than 8 (normal), 34.9% were between 8 y 9 (borderline) and 31.3% were equal or higher than 9 (atherosclerosis probably). Mean BP was 134/81 mmHg. The mean number of RF was 2.79±1.24 and TOD 0.76±0.94.
In multiple linear regression analysis, considering CAVI as a dependent variable, with a corrected R2 = 0.36, the variables that remained in the equation were: systolic blood pressure (ß=0.01, 95%IC 0.01 to 0.02, p<0.001); male sex (ß=-0.25, 95%IC -0.42 to -0.08, p=0.004); age (ß=0.76, 95%IC 0.58 to 0.95, p<0.001); smoking (ß =-0.19, 95%IC -0.38 to 0.00); impaired fasting glucose (ß=0.23, 95%IC 0.02 to 0.47, p< 0.066); obesity (ß =-0.62, 95%IC -0.81 to -0.44, p<0.01); pulse wave velocity (ß =0.49, 95%IC 0.22 to 0.72, p<0.001) and diabetes mellitus (ß=0.32, 95%IC 0.12 to 0.53, p=0.002).

Conclusions: The risk factors associated with CAVI were, systolic blood pressure, male sex, age, smoking, impaired fasting glucose and obesity. Target organ damage as a cardiovascular disease was associated with pulse wave velocity, and diabetes mellitus.

PP.44.34 THE RELATIONSHIP BETWEEN THE CARDIO-ANKLE VASCULAR INDEX (CAVI) AND CARDIOVASCULAR RISK ESTIMATED WITH EUROPEAN AND AMERICAN RISK SCORES. MARK STUDY

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Objective: To analyze relationships between the Cardio-Ankle Vascular Index and cardiovascular risk estimated by scores from European and American populations.

Design and method: We performed a cross sectional study and included 503 subjects, aged 30 to 75 years (mean: 60.35 ± 8.44), 54.3% men, without cardiovascular diseases from the MARK study, selected by consecutive sampling from a Spanish health center. Measurement: Cardio-Ankle Vascular Index (CAVI) using the VaSera device (Fukuda Denshi). Risk factors and cardiovascular risk estimated by SCORE scale (2003), European Guidelines on Hypertension score (2013), Framingham D'Agostino score (2008) and American Heart Association (AHA) score (2013).

Results: The mean CAVI was 8.47±1.06; in men 8.48 ±1.10 and in women 8.44±1.01 (p>0.05). 33.7% of measurements were less than 8 (normal), and 34.9% were between 8 y 9 (borderline) and 31.3% were equal to or higher than 9 (atherosclerosis probably).
The CVR with the Framingham D'Agostino score was 20.05±13.25, with the AHA 2013 it was 13.20±9.89 and with SCORE it was 3.43±3.19. With the European guidelines on hypertension 2013 11% were in the low risk category (CAVI 7.99 ±0.85), 52% were at moderate risk (CAVI 8.31 ±1.00), 23% were at high risk (CAVI 8.76±1.00), and 14% were ar very high risk (CAVI 8.89±1.23) (p<0.01).
We found a positive correlation between CAVI with cardiovascular risk estimated using SCORE (r=0.550), Framingham D'Agostino (r= 0.326) and AHA 2013, (r=0.466) (p<0.001 for all). These associations were maintained after adjustment for age.
In multivariate analysis of variance, controlled by age, we found estimated marginal means of cardiovascular risk in all scores, a lower cardiovascular risk in CAVI < 8, intermediate cardiovascular risk in CAVI between 8-9 and a higher cardiovascular risk in CAVI => 9.

Conclusions: The Cardio-Ankle Vascular Index is directly associated with cardiovascular risk estimated by different scales based on European and American populations, and this is maintained after adjusting for age.

PP.44.35 FIBRINOLYTIC AND INFLAMMATORY ALTERATIONS IN FAMILIAL COMBINED HYPERLIPIDEMIA, AND THE IMPACT OF ANGIOTENSIN II

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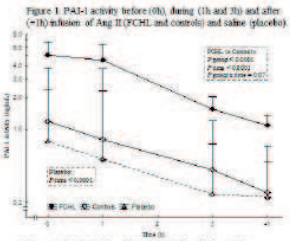
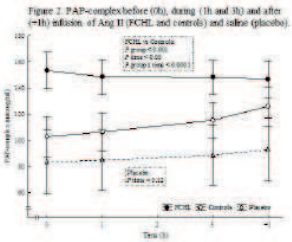
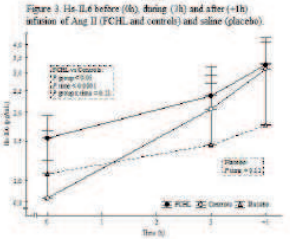
Objective: Subjects with familial combined hyperlipidemia (FCHL) have a poor vascular outcome. Angiotensin (Ang) II may be involved in the development of cardiovascular disease, which is characterized by haemostatic alterations and low-grade inflammation. We studied fibrinolytic and inflammatory alterations, and the impact of Ang II, in 16 otherwise healthy untreated subjects (11 men,

mean age 47±6 years) with FCHL, and 16 age and sex matched healthy controls. Additional experiments with placebo (physiological saline) in 8 subjects verified stability of the experimental design.







Design and method: Plasma markers of fibrinolysis (plasminogen activator inhibitor-1 (PAI-1) activity) and plasmin-antiplasmin (PAP) complex), and inflammation (hs-IL6, leucocyte count, hs-CRP, and fibrinogen) were assessed in conjunction to Ang II infusion (10 ng/kg/min intravenously for 3 h). Blood was collected before, during, and 1h after Ang II infusion. Statistical analyses by repeated measures ANOVA, log transformation when appropriate.

Results: Baseline PAI-1 activity and PAP complex were higher in FCHL (both $p<0.0001$ vs controls). PAI-1 activity decreased during Ang II infusion, similarly in FCHL, controls, and by placebo (all $p<0.0001$, Figure 1), whereas PAP-complex was unaffected in FCHL and by placebo, but increased in controls ($p<0.0001$, Figure 2). Baseline hs-IL6, leucocyte count, and hs-CRP were higher in FCHL ($p<0.01$, $p<0.01$, and $p<0.05$ vs controls), while fibrinogen was similar in both groups. During Ang II, hs-IL6 increased in FCHL and controls (both $p<0.0001$), while the increase in placebo was non-significant ($p=0.11$, Figure 3). Also, leucocyte count increased in FCHL and controls during Ang II ($p<0.0001$ and $p<0.001$), while leucocyte count levels were unaffected by placebo. Fibrinogen was unchanged by Ang II in all groups.

Conclusions: FCHL exhibits signs of increased fibrinolytic activity and ongoing low-grade inflammation, and this may contribute to the development of future cardiovascular complications in patients with FCHL. In addition, Ang II has proinflammatory effects and appears to impair fibrinolysis in FCHL.

PP.44.36 EARLY EFFECT OF SMOKING CESSATION ON ARTERIAL STIFFNESS AND ADIPOSITY INDICES

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Objective: Smoking has been associated with increased arterial stiffness and low serum levels of adiponectin (APN), an adipocytokine with insulin-sensitizing, anti-inflammatory and anti-atherogenic properties. The objective of this study was to assess the early effect of smoking cessation supported by bupropion on arterial stiffness and APN levels of hypertensive individuals.

Design and method: Hypertensive smokers with no additional cardiovascular risk factors were administered 150 mg sustained-release bupropion twice daily for 9 weeks. Quitters constituted the active group and non-quitters the control group. Arterial stiffness was assessed as carotid-femoral pulse wave velocity (PWV) measured via an automatic computerized technique (Complior; Artech Medical, Pantin, France). Sandwich enzyme-linked immunosorbent assays were employed for the measurement of serum APN and cotinine, the latter used for validation of self-reported abstinence. Blood pressure measurements were performed in the non-dominant arm using a standard mercury sphygmomanometer.

Results: Among the 102 participants (mean age 50.1±9.4 years, 51 females, Brinkman index 508.9±87.5, body mass index 27.8±4.7 kg/m2, waist circumference 97.4±12.3 cm, baseline PWV 9.5±1.4 m/s and APN 6.4±1.4 mg/L), 42 (41.2%) had quitted smoking at week 9. Quitters showed significant post-cessation decrease in PWV (mean difference from baseline -1.3±0.5 m/s, 95% CI -0.3, -2.5; $p<0.05$) and pulse pressure (PP, mean difference -3.0±4.4 mmHg, 95% CI -1.5, -5.1; $p<0.01$), while their post-cessation APN levels increased (mean difference 1.5±0.6 mg/L, 95% CI 0.6, 2.8; $p<0.01$). Non-quitters' PWV, PP, and APN remained unaltered. PWV change in quitters showed highly significant correlation with APN change ($r=0.855$, $p<0.001$). In a multivariate linear regression model, age (standardized beta coefficient =0.387, $p=0.008$), APN levels (beta= -0.277, $p=0.021$) and PP (beta=0.480, $p=0.002$) were independently associated with post-cessation PWV, explaining about half of its variance ($R^2=0.498$).

Conclusions: PWV and PP appear to decrease, whereas serum APN seems to increase early after smoking cessation in hypertensive subjects. This finding may provide further insight into the mechanisms related to the detrimental effects of smoking and the benefits of quitting with respect to large artery stiffness.

PP.44.37 CORRELATIONS OF AORTIC PULSE WAVE VELOCITY WITH MARKERS OF CALCIFICATIONS IN HYPERTENSIVE PATIENTS

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Objective: Osteoprotegerin (OPG) and receptor activator of nuclear factor kappa-B ligand (RANKL) have an important role in several aspects of the processes leading to vascular calcification. The aim of this study was to evaluate the relationship between OPG and RANKL and aortic pulse wave velocity (PWV) in hypertensive patients with or without coronary artery disease (CAD).

Design and method: This study was done on a total number of 223 hypertensive patients divided into 2 groups according to the presence or absence of CAD: 140 patients with angiographically confirmed CAD and 83 patients without CAD. The patients were compared to a control group consisting of 74 healthy subjects. Aortic pulse wave velocity and augmentation index were measured using the Medexpert Arteriograph. RANKL and OPG concentrations were determined using specific ELISA tests.

Results: The values of PWV were significantly higher in hypertensive patients with CAD compared to hypertensive patients without CAD and CONTROL group (12.6±0.73 m/s vs 12.1±0.98 vs 8.6±0.62 m/s, all $p<0.001$). A significant positive correlation was observed between PWV and OPG ($r=0.833$, $p<0.001$) and a significant negative correlation between PWV and RANKL ($r=-0.540$, $p<0.001$). According to the findings, we evaluated the ratio between OPG/RANKL as potential diagnostic biomarker of calcification and PWV and found a significant positive correlation ($r=0.541$, $p<0,001$).

Conclusions: These findings suggest that OPG and RANKL could become valuable tools for assessment of additional risk in hypertensive patients, expressing arterial calcification associated with arterial stiffness determined by PWV.

PP.44.38 RELATIONSHIP BETWEEN QUANTITATIVE MARKERS OF ARTERIAL CALCIFICATION AND INTIMA-MEDIA THICKNESS IN HYPERTENSIVE PATIENTS

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Objective: Osteoprotegerin (OPG) and receptor activator of nuclear factor kappa-B ligand (RANKL) are important regulators of mineral metabolism in both bone and vascular tissues. The aim of this study was to evaluate the relationship between OPG and RANKL and carotid intima-media thickness (IMT) in hypertensive patients with or without coronary artery disease (CAD).

Design and method: The prospective study was conducted on a total number of 223 hypertensive patients divided into 2 groups according to the presence or absence of CAD: 140 patients with angiographically confirmed CAD and 83 patients without CAD. The patients were compared to a control group consisting of 74 healthy subjects. OPG and RANKL concentrations were determined by ELISA.

Results: The values of OPG were significantly higher in hypertensive patients with CAD compared to hypertensive patients without CAD and CONTROL group (3.9±0.48 vs 2.8±0.62 vs 1.2±0.36 pg/ml, all $p<0.001$). The values of RANKL were significantly lower in hypertensive patients with CAD compared to hypertensive patients without CAD and CONTROL group (0.67±0.16 vs 1±0.84 vs 2±0.11 pg/ml, all $p<0.001$). A significant positive correlation was observed between OPG and carotid IMT ($r=0.824$, $p<0.001$) and a significant negative correlation between RANKL and carotid IMT ($r=-0.454$, $p<0.001$). It was found a significant positive correlation ($r=0.511$, $p<0.001$) between OPG/RANKL and carotid IMT.

Conclusions: These findings suggest that modifications of OPG and RANKL associated with increased carotid intima-media thickness may be used in cardiovascular prevention to detect hypertensive patients with a higher risk to develop atherosclerosis.

PP.44.39 HIGHER GRADES OF HYPERTENSION 'PLAQUE-IN' CAROTID ATHEROSCLEROSIS

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Objective: Essential hypertension (EH) is an established risk factor for carotid atherosclerosis. The present study sought to determinecontributing risk factors for carotid plaque development in patients with newly diagnosed EH.

Design and method: A total of 756 consecutive newly diagnosed, never treated patients with EH grade 1-3 (mean age 52±13 year, 53% males) referred to the outpatient antihypertensive unit of our institution were studied in accordance to the European Society of Hypertension guidelines. Individuals with diabetes or known cardiovascular disease were excluded.All participants under went carotid ultrasound for the assessment of carotid plaque(s) presence and morphology.

Results: The prevalence of carotid plaque(s) presence was 45.6% (1, 2 and >2 plaque(s): 21.6%, 16.1% and 7.9%, respectively). The median value of the percentage of stenosis was 20% (10-30%).The prevalence of stenosis>50% was 2%.Compared to patients without carotid plaques, patients with plaques were older (48±14 vs. 57±11, p<0.001), with higher prevalence of male gender (49% vs. 57%, p=0.025), smoking (30% vs. 41%, p=0.002), metabolic syndrome (43% vs. 51%, p=0.043) and dyslipidemia (34% vs. 51%, p<0.001), higher fasting plasma glucose (95±11 vs. 97±11, p=0.003), LDL-Cholesterol (133±33 vs. 145±37, p<0.001), triglycerides (114±55 vs. 125±59, p=0.007), log hs-CRP (0.11±0.5 vs. 0.23±0.5, p=0.017) and 24-hour pulse pressure (49±8 vs. 52±9, p<0.001) and lower glomerular filtration rate (82±17 vs. 78±22, p=0.02), while they did not differ with regard to 24-hour systolic pressure (125±11 vs. 127±13, p=0.085), diastolic pressure (76±9 vs. 75±10, p=0.16) and heart rate (74±9 vs. 73±9, p=0.17). Logistic regression analysis indicatedage (OR 1.07, 95%CI 1.05-1.09, p<0.001), male gender (OR 2.5, 95%CI 1.68-3.78, p<0.001), dyslipidemia (OR 1.63, 95%CI 1.11-2.41, p=0.014), smoking (OR 1.6, 95%CI 1.07-2.43, p=0.024) and hs-CRP (OR 1.11, 95%CI 1.04-1.18, p=0.003) as independent predictors of carotid plaque(s) presence. However, independently of age, gender, smoking status, fasting plasma glucose and LDL levels, grade 3 EH was associated witha 2-fold higher risk for the presence of plaque(s) compared to grade 1 EH.

Conclusions: Higher blood pressuredoubles the risk for carotid plaque development, independently of traditional cardiovascular risk factors.

PP.44.40 THE VASCULAR ENDOTHELIAL GROWTH FACTOR (VEGF). SOLUBLE VEGF RECEPTOR 1 (SFLT-1) AXIS IS DISTURBED IN EARLY DIABETIC NEPHROPATHY

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Objective: Vascular endothelial growth factors and its receptors have been implicated in the development of microvascular complications in patients with diabetes mellitus type II. However, their role in early diabetic nephropathy has not been clearly defined.

Design and method: Data from ROADMAP (Randomised Olmesartan And Diabetes MicroAlbuminuria Prevention) study, which included 4447 patients with a median follow up of 3.2 years were used. 2430 out of 4447 patients participated in a marker sub-study and half of those were treated with olmesartan. 190 patients in the marker sub-study had established microalbuminuria and 65 developed microalbuminuria after first sampling. A control group consisting of 65 patients was generated by matching for age, sex, BMI, HbA1c, duration of diabetes, baseline urinary albumin creatinine ratio (UACR), baseline GFR, systolic blood pressure and LDL. Serum VEGF and sFlt-1 levels were compared in the three groups. Urine VEGF levels were compared in patients with new onset microalbuminuria (MA) and in controls only.

Results: sFlt-1 was lower in controls than in patients with established or new onset MA (55.3 ± 8.1 vs 108.4 ± 4.0 and 110.8 ± 5.7 vs.; p<0.0001 vs. the other groups). The sFlt-1 levels showed only a weak correlation with the baseline UACR levels (r=0.03). Serum and urine VEGF did not distinguish between patients who developed MA and controls. Olmesartan did not have an effect on serum VEGF and sFlt-1 levels.

Conclusions: sFlt levels are higher in type II diabetics who have established microalbuminria and those that will develop microalbuminuria. Values are not affected by previous treatment with an angiotensin receptor blocker. The clinical implications of these findings must be further investigated.

PP.44.41 ALTERATIONS IN A PANEL OF SERUM BIOMARKERS PRECEDE THE DEVELOPMENT OF MICROALBUMINURIA (MA) IN PATIENTS WITH DIABETES MELLITUS TYPE II

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Objective: The aim of the study was to investigate if specific serum biomarkers indicative of vascular inflammation and endothelial dysfunction can predict the development of microalbuminuria in patients with diabetes mellitus type II.

Design and method: Data from ROADMAP (Randomised Olmesartan And Diabetes MicroAlbuminuria Prevention) study, which included 4447 patients with a median follow up of 3,2 years were used. 2430 out of 4447 patients participated in a marker sub-study and half of those were treated with olmesartan. 65 patients in the marker sub-study developed microalbuminuria after first sampling (cases). A control group was generated by matching for age, sex, BMI, HbA1c, duration of diabetes, baseline urinary albumin creatinine ratio (UACR), baseline GFR, systolic blood pressure and LDL. The inflammatory biomarkers sTNFR-I, sTNFR-II, ST2 (IL-33 receptor), the anti-inflammatory marker C1qR1 (receptor of C1q) and the endothelial stress markers Copeptin and Thrombomodulin were compared in baseline samples of cases and controls. Results of the univariate analysis are presented here.

Results: The inflammatory cytokine sTNFR1 did not differ between future MA patients and controls (1436±86 vs. 1569±66 pg/ml, p=0.246). The inflammatory markers sTNFR-II and soluble ST2 (IL-33 receptor) were significantly increased in patients with future microalbuminuria. The respective mean values were 3183±145, vs. 2858±90 pg/ml (p =0.047) for sTNF-RII and 14450±800 vs. 12464±568 pg/ml (p=0.039) for sST2. The anti-inflammatory marker C1qR (receptor of C1q) was significantly reduced in patients with future microalbuminuria. The mean values in both groups were 34±2.1 vs. 28±2.0 ng/ml (p=0.047). The endothelial stress markers Thrombomodulin and Copeptin were significantly increased in patients with future MA. Especially the results for copeptin were highly significant. The respective mean values in both groups were 4415±161 vs. 4067±96 pg/ml (p=0.054) for Thrombomodulin and 15±1,1 vs. 11±0.48 pg/ml (p=0.003) for Copeptin.

Conclusions: The alterations of serum inflammatory and endothelial stress markers prior to the development of microalbuminuria in patients with diabetes type II, adds to the evidence supporting its significance as a biomarker reflecting vascular inflammation and early vascular damage.

PP.44.42 ALISKIREN AND CAROTID INTIMA-MEDIA THICKNESS IN HYPERTENSIVE PATIENTS: THE EXPERIENCE OF A SPECIALIZED HOSPITAL AMBULATORY

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Objective: Anti-hypertensive drugs are similar in their capability of controlling BP; they may differ in the way they can protect patients against organdamage. The aim of this study is to examine whether Aliskiren, a direct renin inhibitor would influence structural vascular changes beyondthe effects of blood pressure reduction.

Design and method: Caucasian hypertensive patients with Hypertension grade 2 since 3 years with no other cardiovascular risk factorsand treated either with Aliskiren 150 mg.day or 300 mg.day (As) or with Atenolol 100 (group A) were recruited. Echodoppler test were performed to measure carotid medium-intima

thickness at the beginning and after 36 months. These tests were performed by thesame operators who were blinded to previous values and therapy. Bloodpressure (BP) were monitored on a monthly basis by patients' general practitionersand the onset of any cardiovascular risk factors were checked onsixty monthly basis.

Results: One hundred and sixty-two patients were enrolled, aged 28-69, 44 were female. 82 PTS (27 female) belonged to group As and the remaining 80 patients (17 female) belonged to group A. With similar reductions in blood pressure, intima-media thickness was reduced below 0,6-0,9 mm in 81 of 82 PTS group As, no in group A.

Conclusions: Both drug therapy, Aliskiren 150 or 300 mg, once a day and Atenol are good in controlling and maintaining BP values. The A favourable effects on parietal thickness suggest that angiotensin II mediates structuralvascular changes, beyond the effects of blood pressure. This may be important in the prevention of cerebrovascular events.

PP.44.43 INDICES OF RESISTANCE OF RENAL ARTERIES PREDICTORS OF SYSTEMIC VASCULAR DAMAGE IN HYPERTENSIVES

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Objective: To demonstrate that the increase in renal resistant index (RI) can be considered predictive of severe alterations in arterial hypertension. In the literature, there are conflicting data on the possible relationship between increased IR and the intima-media thickness supraaortic vessels. New studies have shown that carotid IMT should be increasing with the progressive deterioration of renal function. The aim of our study was to evaluate, in hypertensive patients the possible correlation between IR and IMT.

Design and method: we enrolled and followed for 48 months 364 patients with arterial hypertension grade 2 (aged between 30 and 64 years), treated only with ace - inhibitors or angiotensin 2 inhibitors . Everyone has been practiced creatinine clearance (CC), Doppler ultrasound of the SAT and renal artery at time 0 and after 48 months.

Results: Patients with IMT >=0.9 mm showed both higher values of IR in the totality of the population studied (< 0.001), both in the subgroups with and without CHD (in both cases p >0,01). A close correlation was found between IMT and IR both in the whole study population (r = 0.43, p <0.001) and in the subgroups (r = 0 42 , p< 0.001) and without CKD (r = 0.039 ; <p0.001).

Conclusions: our results show a strong correlation between carotid IMT renal IR , the IR seem to confirm that , beyond its purely prognostic value of renal failure may be considered a spy of systemic vascular changes.

PP.44.44 ASSOCIATION OF APOLIPOPROTEIN B/ APOLIPOPROTEIN A-I RATIO WITH RAISED CAROTID INTIMA-MEDIA THICKNESS: MARKER OF SUBCLINICAL ATHEROSCLEROSIS IN PSORIASIS PATIENTS

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Objective: Psoriasis patients are at increased risk of cardiovascular diseases (CVD), including atherosclerosis. Previous studies have shown that measurement of serum apolipoprotein may help in prediction of cardiovascular disease, however association between apolipoprotein and carotid intima media thickness (CIMT) has not been studied in detail. The aim of this study was to measure CIMT and estimate its relationship with apolipoprotein B/apolipoprotein A-I ratio in patients of psoriasis.

Design and method: Serum lipid profile and apolipoprotein (apo A-I and apo B) were measured in 150 (75 male and 75 female) psoriasis patients and age-sex matched healthy controls recruited for the study. Carotid intima-media thickness and carotid plaques were simultaneously measured by carotid sonography. The75th percentile values used to determine high risk values for apo B, apo B/apo A-I ratio and mean CIMT were 1.2g/l, 0.73 and 0.70mm respectively.

Results: Prevalence of patients with raised CIMT was higher among patients with apoB/apoA-I ratio exceeding 0.73 as compared to those with ratio less than 0.73 (35% vs 16%, p< 0.001). We found that serum apoB (P < 0.05) and apoB/apoA-I ratio (p < 0.001) significantly correlated with raised CIMT in psoriasis patients. By multivariate regression analysis, we found that increased apoB/apoA-I ratio was associated with raised CIMT (p < 0.001) even after inclusion of other conventional cardiovascular risk factors.

Conclusions: The study shows that apoB/apoA-I ratio is associated with raised intima-media thickness and can be considered as a predictor of subclinical atherosclerosis in patients of psoriasis.

PP.44.45 EVOLUTION OF CAROTID INTIMA-MEDIA THICKNESS IN DIABETIC PATIENTS

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Objective: Was to evaluate carotid intima-media thickness (cIMT) and carotid injury and its progression with age in patients with diabetes in comparison with hypertensive patients and a control group.

Design and method: A cross sectional study was done between 2010 and 2014 on a population of 732 patients with age between 30 and 80 years, of which 314 (42,9%) diabetics, 267 (36,6%) hypertensives and 151 (20,6%) in the control group. Clinical, paraclinical data, carotid IMT and risk factors were analysed.

Results: The difference of cIMT between the control group and diabetics was 0.096 mm (CI 95%, 0.056-0.134), between the control group an hypertensives 0.052 mm (95% CI, 0.021-0.087) and between diabetics and hypertensives 0.041mm (95% CI, 0.011-0.073). After adjusting these differences for age, multiple liniar regression analysis documented a cIMT year increase of 0.005 mm in diabetics, 0.006 mm in hypertensives and 0.0045 mm in the control group. cIMT correlated in diabetics positively with male gender (p=0.01), age (p=0.006), hypertension (p=0.01), triglycerides (p=0.027) and inversely with HDLc (p<0.05). The incidence of carotid damage (CIMT greater than 0.9 mm and/or presence of atherosclerotic plaques) was greater in diabetics (88 cases, 28%) than in hypertensives (45 cases, 16.8%) and in the control group (7 cases, 4.6%).

Conclusions: CIMT was greater in diabetes than in the control and hypertensive patients, but its annual increase was greater in hypertensives than diabetics.

PP.44.46 INCREASED ARTERIAL STIFFNESS ASSESSED BY CARDIO-ANKLE VASCULAR INDEX IS AN INDEPENDENT RISK FACTOR OF LEFT VENTRICULAR DIASTOLIC DYSFUNCTION

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Objective: Arterial stiffness is an important risk factor of left ventricular diastolic dysfunction. Cardio-ankle vascular index (CAVI) reflects arterial stiffness and has been used as a novel method of screening for atherosclerosis. Increased CAVI is associated with the onset or prognosis of cardiovascular disease. On the other hand, the peak early diastolic mitral annular velocity (E') measured by tissue Doppler echocardiography has been widely used for assessing left ventricular diastolic function recently. Because E' is less influenced by left ventricular preload compared with parameters of conventional Doppler echocardiography. There are few reports which clarified the relationship between arterial stiffness assessed by CAVI and left ventricular diastolic dysfunction measured by tissue Doppler echocardiography. In this study, we investigated whether CAVI is associated with E' in patients with cardiovascular disease.

Design and method: From January 2008 until September 2013, we investigated 432 subjects with cardiovascular disease who were hospitalized in Kagoshima University Hospital, Japan. Among 432 patients, 72% of the subjects were male. Average age was 67 ± 11 years. All patients were performed CAVI. Left ventricular end-diastolic dimension (LVDd) and left atrial dimension (LAD) were measured by echocardiography. E' was assessed by tissue Doppler echocardiography.

Results: Measurements of echocardiography showed that average LVDd was 49.6 ± 7.7 mm, LAD was 39.9 ± 6.2 mm and E' was 5.47 ± 1.98 cm/sec. Average CAVI

was 8.5 ± 1.3. Linear regression analysis showed that age (R=-0.381, P<0.0001), LVDd (R=-0.185, P<0.0001), LAD (R=-0.187, P<0.0001) and CAVI (R=-0.281, P<0.0001) negatively correlated with E'. E' did not correlate with systolic and diastolic blood pressure. Multiple regression analysis demonstrated that age (P<0.0001), LVDd (P<0.001) and CAVI (P<0.01) independently correlated with E'.

Conclusions: Increased arterial stiffness assessed by CAVI is an independent risk factor of left ventricular diastolic dysfunction measured by tissue Doppler echocardiography in patients with cardiovascular disease. CAVI is a useful non-invasive method to assess arterial stiffness and increased CAVI predicts left ventricular diastolic dysfunction.

POSTERS' SESSION

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PUBLIC HEALTH

PP.45.01 HEALTH EDUCATION OF HYPERTENSION ON DRUG TREATMENT. THE INFLUENCE OF DEPENDENCY

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Objective: Through the high blood pressure patients health education, improve the high blood pressure patients with high blood pressure all aspects of knowledge, improve hypertension patients healed at the medical behavior, improve the patients with high blood pressure drug dependency, and ultimately improve the quality of life of patients with high blood pressure .

Design and method: The table of random number method, in May 2012 to October in LAN Zhou university second hospital of 200 cases of high blood pressure patients were randomly divided into the experimental group and the control group ,Each group of the 100 cases . The study group with collective knowledge teaching, multimedia demonstration, combined with individual talk, follows up, medication guide, daily life education guidance, etc; The comparison group issued only hypertension information, without any guidance, self-management. After two months follow-up, for drug dependency evaluation In the intervention respectively before and after the intervention follow-up ,the Morikis recommended evaluation of essential hypertension patients medication compliance of four questions .

Results: The experimental group of drug treatment dependency raised from 76% to 96%,;the control group drug treatment dependency raised from 76% to 86%,and the front life style population proportion of low salt,weight-control,exercises,smoking cessation and temperance raised respectively from 7.0%,8.0%,10.0%,11.0% to 38.0%,29.0%,66.0%,47.0%,($P<0.05$).

Conclusions: The health education model that professional doctors conducted face to face talk to hypertension patients was successful. It enhanced the conscious of self-care, changed the unhealthy life style, and improved the treatment compliance, then finally resulted in effective anti-hypertension effect.

PP.45.02 SALT REDUCTION INTERVENTION TRIAL TO PREVENT CHRONIC DISEASES IN THE MUANG DISTRICT, CHAING RAI, THAILAND: BASIC CHARACTERISTICS AT BASELINE

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Objective: To estimate daily salt intake and basic characteristics of participants with high salt intake among those with a high cardiovascular disease (CVD) risk in northern Thailand.

Design and method: This study was a cluster randomised trial (February 2012 to March 2013) conducted among 793 community-dwelling participants with Framing general CVD risk scores >15%. All patients had visited diabetes or hypertension clinics at health centres in the Muang district (Chiang Rai, Thailand). We performed descriptive analysis of baseline data and used an automated analyser to estimate mean 24-hour salt intake in urine collected overnight for 3 days. Participants with daily salt intake >=10 g were defined as the "high salt intake group" based on median daily salt intake.

Results: Mean age and proportion of males were 65.2 years and 37.6% in the high salt intake group (N=431), and 67.5 years and 42.7% in the low salt intake group (N=362), respectively (P=0.01, P<0.01). Systolic and diastolic blood pressures did not differ significantly between groups. The high salt intake group comprised more patients with family histories of hypertension, antihypertensive drug use and exercise frequency (>=2 times weekly). In contrast, the high salt intake group had a lower ideal body mass index (18.5-24.9) and lower awareness of high salt intake compared to the low salt intake group. High salt intake participants with lower awareness of their high salt intake were younger and more often showed family histories of hypertension, relative to those with more awareness.

Conclusions: Descriptive analysis of baseline data showed characteristics associated with high salt intake, which included high levels of hypertensive medication, family histories of hypertension, and low awareness of high salt intake. Among the high salt intake group, those with low awareness of high salt intake were likely to have higher family histories of hypertension. Our data indicated that families often share lifestyles involving high salt intake, and discrepancies between actual salt intake and awareness of high salt intake may represent a need for salt reduction. Awareness of actual salt intake should be improved for each family.

PP.45.03 HYPERTENSIVE WOMEN ARE CHARACTERIZED BY POOR QUALITY OF LIFE COMPARED TO HYPERTENSIVE MEN

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Objective: Females and the elderly, demonstrate low scores of health-related quality of life (H-rQoL) as far as coronary artery disease is concerned. We assessed the hypothesis that age and gender have an influence on H-rQoL in the setting of essential hypertension (EH).

Design and method: We studied 154 subjects with untreated uncomplicated stage I-II EH (aged =54.9 ± 8 years, male =78 female =76 , office BP=152/92 mm Hg).Both female and male group of patients were matched for age, office BP and lipid parameters. The validated Greek version of the Short Form 36 (SF-36) General Health Survey questionnaire was administered to all participants. The eight subscales were further grouped into two summary scales: the physical component summary (PCS) and the mental component summary (MCS). Non-parametric Mann-Whitney ans Spearmann tests were performed.

Results: Females scored significantly lower in the physical functioning dimension when compared to men (Table). This decline in the female group is negatively correlated to age (r = -0.328, p=0.002).

Table. Comparison of SF-36 scores among male and female hypertensives.

SF-36 SCALES	MALE (n=78)	FEMALE (n=76	P-VALUE
Physical functioning	57.54	44.78	0.02
Role physical	49.95	50.14	0.71
Bodily pain	53.94	45.78	0.07
General health	54.28	47.78	0.29
Social functioning	52.65	48.32	0.42
Mental health	53.22	48.15	0.38
PCS	54.72	45.37	0.11
MCS	52.44	49.27	0.54
Total SF-36 score	53.34	47.46	0.31

Conclusions: Older women may represent a more vulnerable group of hypertensives, as far as their physical functional capacity is concerned. Quality of life has hitherto been underestimated but should be more intensively considered in parallel to hypertension control.

PP.45.04 EASTERN EUROPEAN HYPERTENSIVE IMMIGRANTS ARE CHARACTERIZED BY POOR HEALTH-RELATED QUALITY OF LIFE IN COMPARISON TO NATIVE HYPERTENSIVES

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Objective: Much of the variance in hypertension-related sequelae across ethnic groups, is highly related to deficits in accurate health-related data.We sought to evaluate the burden of migration on health-related quality of life (H-rQoL) in the setting of essential hypertension (EH).We hypothesised that immigrants would indicate lower scores in the most dimensions of H-rQoL than natives, reflecting differences in social-economic status.

Design and method: We studied 67 Eastern European immigrants with newly diagnosed untreated stage I-II EH (aged 51±15 years, 35 male, office blood pressure (OBP)=159/92 mm Hg), who immigrated to Greece within the previous two years and 61 hypertensives natives matched for age, gender and OBP. The validated Greek version of the Short Form 36 (SF-36) General Health Survey questionnaire was administered to all participants. The subscales were further grouped into two summary scales: the physical component summary (PCS) and the mental component summary (MCS). Non parametric Mann-Whitney tests were performed.

Results: Hypertensive immigrants scored significantly lower in all dimensions of SF-36 when compared to natives. (Table 1)

Table 1. SF-36 SCORING

SF-36 SCALES	IMMIGRANTS	NATIVES	P-VALUE
Role physical	39±13	68±24	0.001
General health	41±15	67±26	0.05
Vitality	33±12	72±27	0.001
Social functioning	28±12	75±26	0.001
Role emotional	31±13	74±28	0.001
Mental health	32±12	74±27	0.001
PCS	41±16	69±26	0.05
MCS	31±14	74±27	0.001
TOTAL SF-36	35±17	74±27	0.001

Conclusions: Immigration process and resettlement experience jeopardizes H-rQoL in the setting of EH. It is crucial for primary health care units and other social services to conduct screening programmes for hypertension and its impact to the psychological well-being of the migrating people.

PP.45.05 PREVALENCE OF ARTERIAL HYPERTENSION AND MAJOR CARDIOVASCULAR RISK FACTORS VARYING WITH ACCESS TO MEDICAL SERVICES IN A ROMA ETHNIC COMMUNITY. DATA FROM THE ROMA STUDY

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Objective: To evaluate the prevalence and clinical correlates of arterial hypertension (HTN) and major cardiovascular (CV) risk factors varying with access to medical services (AMS) in a Roma ethnic community. As this population is known to suffer from severe CV diseases, we aimed to show how AMS may influence life style and adherence to therapy in this group.

Design and method: 806 Roma adult subjects (age range 18-83 years) regardless of medical history were included between 2012 and 2013. Four hundred patients came from a low-AMS community and 406 came from a better-AMS community. For each subject we recorded demographic and anthropometric data, presence of major CV risk factors and blood pressure measurements using adequate cuff size. We defined visceral obesity as waist circumference >88 cm in females, >102 cm in males. Diabetes mellitus was considered as fasting glycemia >126 mg/dl or known diabetes.

Results: See table.

Parameters	Low-AMS (A)	Better-AMS (B)	p (A vs B)
Access to medical services, %	50.37	49.63	ns
Arterial hypertension, %	47.6	52.3	ns
Controlled HTN, %	34.11	55.63	0.01
Newly-diagnosed HTN, %	31.78	20.42	0.03
Awareness HTN, %	68.22	79.58	0.03
Drug-treated HTN, %	52.71	59.15	ns
Diabetes mellitus, %	33.33	27.46	ns
Dyslipidemia, %	62.02	85.92	0.01
Visceral obesity, %	70.54	71.83	ns
Obesity (BMI>30), %	56.59	51.41	ns
Smoking, %	45.74	46.48	ns

Conclusions: These groups seem to be equally affected by HTN. However, newly diagnosed cases, uncontrolled HTN and low adherence to drug-therapy were significantly more frequent in subjects with low AMS, while HTN control and awareness was significantly higher in the better-AMS group (p 0.03). The prevalence of some major CV risk factors such as smoking or obesity (especially visceral) was similar between the two groups, while dyslipidemia was more frequent among subjects with better AMS. These results may form the basis of future health or educational programs specially designed for this population.

PP.45.06 SYMPTOMS OF ANXIETY AND DEPRESSION ACROSS ADULTHOOD AND BLOOD PRESSURE IN LATE MIDDLE AGE: THE 1946 BRITISH BIRTH COHORT

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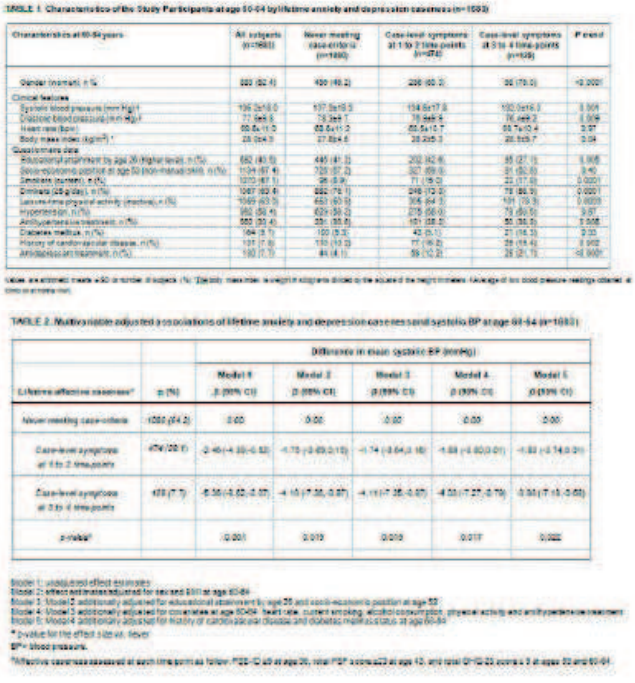
Objective: Previous studies testing the hypothesis that symptoms of anxiety and depression increase blood pressure (BP) levels show inconsistent and limited findings. We examined the association between those symptoms across adult life and BP in late middle age.



Design and method: Using data from 1683 participants from the MRC NSHD, we investigated associations between symptoms of anxiety and depression at ages 36, 43, 53 and 60-64 and systolic and diastolic BP at age 60-64. Multivariable linear regression was used to examine the effect on BP of symptoms of

anxiety and depression at each age separately and as a categorical cumulative score based on the number of times an individual was classified as a 'case'. Models were adjusted for gender, BMI, educational attainment, socio-economic position, heart rate, lifestyle factors and antihypertensive treatment.

Results: Table 1 presents the general characteristics of the 1683 study members (52.4 % women) at age 60-64 by lifetime symptoms of anxiety and depression status.In table 2, the unadjusted model (model 1) showed that study members reporting case-level affective symptoms at 1 to 2 time-points had lower systolic BP at age 60-64 than those never meeting case criteria, as well as study members meeting criteria at 3 to 4 time-points (p-value for trend 0.001).After full covariate adjustment (model 5), we observed a clear inverse dose-response for lower systolic BP in relation to frequency of affective caseness suggesting a cumulative impact of anxiety and depression on systolic BP across adulthood (p-value for trend 0.022). Gender and BMI had a large impact on the estimates while not other confounders. Potential mediators such as heart rate and lifestyle behaviours had little impact on the association. A similar but weaker trend was observed for diastolic BP.

Conclusions: A cumulative effect of symptoms of anxiety and depression across adulthood results in lower systolic BP in late middle age that is not explained by lifestyle factors and antihypertensive treatment. Mechanisms by which mood may impact BP should be investigated.

PP.45.07 BUILDING COMMUNITY CAPACITY: ENGAGING INDIVIDUALS IN KNOWLEDGE-TRANSFER ON THE DETERMINANTS OF HYPERTENSION

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Objective: In Cape Breton, Nova Scotia hypertension is a major health problem. Almost one-third of the population over the age of twenty have hypertension and in people with diabetes rates increase to 70%. It is not known what people in Cape Breton know about hypertension and its determinants. The relationship between sleep quality and hypertension is also not known.
The purpose of this study was to assess: 1) the knowledge of participants of the determinants of hypertension; 2) participants' understanding of the relationship between sleep quality and hypertension and 3) to determine whether providing education on the determinants of hypertension leads to lifestyle changes.

Design and method: Participants were recruited from four communities in Cape Breton over a six-month period. Participants' knowledge of the determinants of hypertension and their understanding of the relationship between sleep quality and hypertension was assessed by a short questionnaire. Following completion of the questionnaire, education was provided on lifestyle behaviors for maintaining or achieving optimal blood pressure control. The participants were contacted at two-weeks and four-weeks following the education session to determine lifestyle changes, if any.

Results: Seventy-six individuals participated in the study, of which fifty-two were females and twenty-four were males. Descriptive statistics were carried out to characterize the study population. Responses to the questionnaire revealed 27.3 % of participants were aware that smoking was a determinant, 14.1 % associated a lack of physical activity with hypertension, 22.4% recognized a diet high in sodium was a determinant, 26.4% associated stress with hypertension and 7.6% of participants viewed poor sleep quality as a contributing factor to hypertension. Participants also demonstrated very poor understanding of the relationship between sleep quality and hypertension. Although self-reporting, 56% of participants reported implementing behavior changes for maintaining or achieving optimal blood pressure control.

Conclusions: Knowledge about the determinants of hypertension is poor in Cape Breton. The relationship between sleep quality and hypertension is also poorly understood. Community-based prevention and intervention programs for achieving or maintaining optimal blood pressure control must be developed.

PP.45.08 PROFILE OF THE ADULT ROMANIAN FEMALE HYPERTENSIVE

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Objective: Description of epidemiological features of arterial hypertension in Romanian adult female population.

Design and method: Adult females included in the national representative SEPHAR II survey were analyzed in terms of socio-demographic characteristics, cardiovascular risk factors, blood pressure and anthropometric measurements, subclinical target organ damage, established target organ disease, total cardiovascular risk, hypertension awareness, treatment and control.
Arterial hypertension, blood pressure control and total cardiovascular risv were defined according to the 2013 ESH-ESC Guidelines.
The profile of the Romanian female hypertensive was build using the mod of every above mentioned target variables.

Results: Between October 2011 –March 2012, 1038 adult females were included in SEPHAR II study, 438 of them being hypertensive (42.2%).
The majority of hypertensive women lives in urban area (61.9% vs. 38.1%) and associate other cardiovascular risk factors: dyslipidemia (80.8%), sedentary lifestyle (72%), visceral obesity (71,6%), metabolic syndrome (59%), family history of cardiovascular disease (25.8%), diabetes mellitus (18.7%), smoking (12%).
Of all hypertensive women, 10.3% were newly diagnosed with hypertension (107 subjects), while 31.9% of women were aware of their disease.
Regarding treatment of hypertension, 66.9% were receiving treatment, but only 23.5% attained blood pressure targets.
The majority of hypertensive women were receiving a combination of two hypertensive drugs.
The most frequent used antihypertensive drugs were: diuretics (61.4%), ACEI (58%), beta blockers (53.9%), calcium channel blockers (23.9%), sartans (14.3%), central acting antihypertensive drugs (0.3%).

Conclusions: The majority of hypertensive women in Romania lives in urban areas, and a large proportion of them associate other cardiovascular risk factors, the most frequent being dyslipidemia.
Most of the hypertensive women are aware of their disease, they receive antihypertensive drugs, but they don´t reach the recommended blood pressure targets.

PP.45.09 QUALITY OF LIFE IN MENOPAUSAL WOMEN WITH HYPERTENSION

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Objective: To determine the quality of life of menopausal women diagnosed of hypertension in a health district.

Design and method: A descriptive, cross-sectional, retrospective, observational study with no control group; that is, prevalence in the area of Primary Care Zone in Tarancón (Cuenca) on menopausal women amenorrhea 12 consecutive months. 400 postmenopausal women diagnosed with MS by NCEP ATP III participated in the study, from January 2010 until the first quarter of 2011. They fulfilled the Quality of Life questionnaire SF -12 to construct variables for the study. validated for the Spanish population.

Results: The mean age of women in the study was 66.93: the onset of menopause was 48.76years. The average time in menopausal women in the study was 18.11years. Regarding the quality of life perceived by the women in the study, obtaining eight dimensions of health profile and two component summaries, physical and mental:
1. General Health 52 % had a regular health perception; although it was good for 40.5%.
2. Physical Functioning most looked very limited physically, especially at climbing stairs (46.3 %).
3. The Role limitations-Physical health interfered with work and other tasks so that 46 % of women did less work than they would like.
4. Bodily Pain was no problem for 29.5 %, and it made a little harder to perform activities in 23%.
5. Vitality over half of women had this feeling of energy only sometimes.
6. Social Functioning in 43% of women, physical or emotional problems never interfered with social life; this only happened occasionally in 22% of cases.
7. Role-Emotional emotional problems had no negative impact on daily activities in more than 60% of women.
8. Mental Health while 57.3 % showed nervousness, 76.5 % were found rarely sad.

Conclusions: The mean scores of the physical component summary PCS12 is below the Spanish population mean; this also happens for the mental component summary MCS12, exceeding the population mean in women over 65 years. Factoring by age groups, no difference in the mental component is found. However, the physical component is significantly worse in women older than.

PP.45.10 DRINKING WATER SODIUM AND HYPERTENSION: A REVIEW OF EPIDEMIOLOGICAL EVIDENCE

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Objective: Saline water intrusion into freshwater resources in coastal areas is the major impact of climate change and global sea level rise. Water resources in all the eleven Asian mega-deltas and other large deltas such as the Nile and Mississippi are vulnerable to saline intrusion. Given food is the major source of dietary sodium; epidemiological studies assessing the health effects of increased intake through water have been scanty. An investigation of the human health impacts is urgently required to adopt appropriate adaptation strategies. In this systematic review of epidemiological studies we highlight the effect of drinking water salinity, measured with sodium content, on hypertension, as one of the potential health outcomes.

Design and method: We conducted a literature search using the electronic databases PubMed (National Library of Medicine 2011), Scopus (Elsevier 2011) and Web of Science (Thomson Reuters 2011). We identified the journal articles published in English since 1960.

Results: Of the 16 studies analysed, majority were conducted in children aged between 8-18 years. One study was conducted with young infants (< 2months), two other included population older than children and one study was conducted among pregnant mothers. Besides cross-sectional and ecological study (n=12), experimental (n=2) and prospective or retrospective follow-up (n=2) designs were adopted in the research. Seven cross-sectional studies showed statistically significant positive association between water sodium content and mean increase in blood pressure (1.8-4.0mmHg). Evidence from follow-up study (n=1) and experimental research (n=1) further supported this relationship.
In all the studies the level of sodium in drinking water ranged between (~100- ~400mg/L), except the study of coastal areas of Bangladesh where maximum level of sodium in water was 12.8g/L during dry season. And this was linked with a higher proportion of pregnant mothers with hypertension during dry (12%) than wet season (5%).

Conclusions: Our review of epidemiological studies suggests a potential effect of water sodium on human blood pressure despite methodological drawbacks. By study design, the evidence of association from cross-sectional studies is considered weak. Further investigation through hierarchical study design of prospective or retrospective type is warranted.

PP.45.11 PSYCHOLOGICAL DISTRESS PREDICTS THE DEVELOPMENT OF HYPERTENSION OVER 5 YEARS IN A BLACK POPULATION WITH OPTIMAL BLOOD PRESSURE

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Objective: The alarming increases in the prevalence and incidence of hypertension in black populations have devastating consequences evidenced by disturbing cardiovascular morbidity and mortality rates. This reality compels the evaluation of a wide range of potential exposures that may lead to the development of hypertension. We assessed psychological distress in a black population with optimal BP (<=120/80 mmHg) and how it relates to a 5-year change in BP.

Design and method: In an epidemiological study including 2021 Africans aged >35 yrs, we identified 478 individuals with optimal BP. Psychological distress was measured in 157 of these participants using the Kessler six-question K6 screening scale (implementing a 1-5 rating scale per item) adopted by the WHO and designed to monitor population prevalences of non-specific psychological distress. The K6 is known to be sensitive for discriminating between cases and non-cases of serious mental illness.

Results: Over 5 years, 17 of the 158 participants died and 34 were lost to follow-up. From the remaining 106 participants with optimal BP at baseline 17% manifested K6 scores exceeding the cut-off of 19, and 22.6% were hypertensive at follow-up.

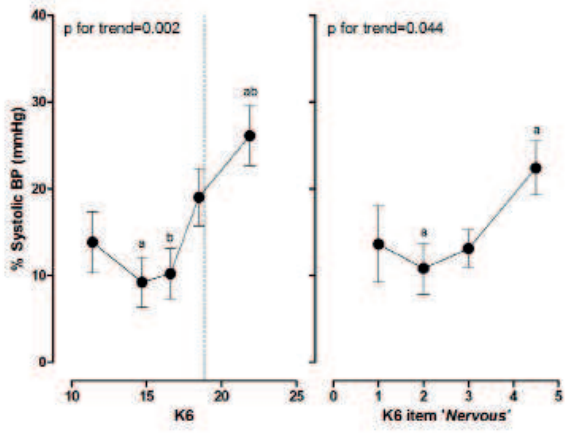

Fig. 1. Percentage change in SBP according to K6 measures of psychological distress.

In multivariable-adjusted analyses, the 5-year percentage change in SBP was independently explained by K6 (β=0.28; p=0.007). In multivariable adjusted Cox regression analyses, psychological distress predicted hypertension (for K6 the hazard ratio was 1.13 [1.01–1.30] and for the question on being nervous over the past month the hazard ratio was 1.93 [1.19–3.14]). Regression models were adjusted for baseline blood pressure, waist circumference, fasting glucose, high-density lipoprotein-cholesterol, γ-glutamyl transferase and HIV status.

Conclusions: Psychological distress as measured with the K6 predicted the elevation of SBP over 5 years in a black community. This result emphasises the potential usefulness of low-cost screening instruments in identifying individuals at risk for the development of cardiovascular disease in low-resource settings.

PP.45.12 EPIDEMIOLOGICAL STUDY OF HYPERTENSIVE EMERGENCIES AND URGENCIES: DATA FROM THE CARDIOLOGY DEPARTMENT OF A GREEK DISTRICT GENERAL HOSPITAL

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Objective: Arterial hypertension is a highly prevalent condition and evidence based recommendations guide diagnosis and management. One aspect of its clinical spectrum, hypertensive urgencies and emergencies, remains underrepresented in these guidelines partly due to the lack of epidemiological data. We sought to define the prevalence and study patient characteristics of hypertensive urgencies and emergencies in the Emergency Department of our hospital over a period of one year.

Design and method: We studied the records of 1109 patients who presented to the Cardiology Branch of our hospital's Emergency Department (ED) in the year 2010. We defined hypertensive urgencies (HU) as asymptomatic elevations of systolic blood pressure (SBP) >180 mmHg and/or diastolic (DBP) >120 mmHg and hypertensive emergencies (HE) as large BP elevations associated with clinical evidence of organ damage (hypertensive encephalopathy, stroke, acute pulmonary edema, acute renal failure).

Results: The prevalence of HU and HE was 14.9%. Our patients were mostly female (53%). Mean patient age was 71 years. Patients classified in the HU group (83.8%) had a mean BP of 185/105 mmHg; the most common reason for the ED visit was abnormal BP reading (41%). Patients classified in the HE group (16.1%) had a mean BP of 195/110 mmHg; the most common form of organ damage was acute cardiac failure (32%). 3% of the patients did not have a prior history of hypertension. In 92% of cases a specific cause for the BP elevation could be identified; most commonly non adherence to dietary and drug therapy. All HE patients and 22% of the HU patients were admitted to the Cardiology Department while the rest were admitted to the Short Stay Ward of our ED. All of the patients underwent serial laboratory testing, electrocardiograms and echocardiographic examinations.

Conclusions: Hypertensive urgencies and emergencies are a common clinical problem for the hospital based cardiologist. Such patients require hospital admission and in some cases prolonged stay and thus utilize a significant part of healthcare resources. It is speculated that many of these events could have been prevented through better patient education or adherence to treatment.

PP.45.13 GENDER RELATED HOSTILITY IN NEWLY DIAGNOSED ESSENTIAL HYPERTENSION

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Objective: A growing body of evidence indicate the implication of hostility in the elicitation and course of hypertension, however the exact nature of this phenomenon is poorly understood especially concerning the gender aspect. Taking into account this caveat the present study focuses to investigate the gender related hostility in newly diagnosed hypertension.

Design and method: The study population consisted of 107 newly diagnosed hypertensive Patients, 61 males (mean age=48.9±9.7) and 46 females (mean age=50.7±10.9) All subjects underwent 24-hour ambulatory blood pressure monitoring (ABPM) (Spacelabs 90207) in order to establish the diagnosis of hypertension and to exclude white coat hypertension. The subjects were measured on a working day and were instructed to perform as usually.
Exclusion criteria were current or recent use of medications including psychiatric and antihypertensive drugs, as well as the diagnosis of any systemic disease or psychiatric disorder.
In order to assess the hostility status all subjects completed the Hostility and direction of Hostility Questionnaire (HDHQ) which presents seven biologically-based independent dimensions of hostility. Acting out Hostility/Critic to the Others/Delusional-deranged Hostility/Self Critic/Guilt/Introversion-Extroversion and Direction.
The SPSS statistical package was used to store and analyse the data.

Results: There were not significant differences between the two groups concerning baseline characteristics as well as blood pressure measurements (office and ambulatory). Analyses revealed that male subpopulation as compared to the female one exhibited statistically significant increase regarding the urge to act out hostility(p= 0,014),an increasing introversion status(p=0,019), and they showed statistically increased the self rated self criticism (p= 0,002) .On the other hand the female subpopulation demonstrated an increased guilt dimension (p=0,027) compared to the male one. Finally, concerning the direction of hostility a clear dominance of the male population has been noticed (p=0,001).

Conclusions: The study provides further evidence indicating the gender related hostility differences between newly diagnosed hypertensive patients and this linkage might deserve greater attention from diagnosticians and health professionals.

PP.45.14 GENDER DIFFERENCES AND PERSONALITY TRAITS ASSESSED BY EYSENCK PERSONALITY QUESTIONNAIRE IN NEWLY DIAGNOSED HYPERTENSION

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Objective: There is growing evidence suggesting gender differences in essential hypertension explained by the specific role of sex hormones. However little is known about gender differences concerning personality traits in essential hypertension.
The aim of our study was to compare extroversion, neuroticism and psychoticism in men and women suffered from essential hypertension at the time of the diagnosis.

Design and method: The study population consisted of 106 newly diagnosed hypertensive patients.
All subjects underwent 24-hour ambulatory blood pressure monitoring (ABPM) (Spacelabs 90207) in order to establish the diagnosis of hypertension and to exclude white coat hypertension. The subjects were measured on a working day and were instructed to perform as usually.
Exclusion criteria were current or recent use of medications including psychiatric and antihypertensive drugs, as well as the diagnosis of any systemic disease or psychiatric disorder
In order to assess personality traits all subjects completed the Eysenck Personality Questionnaire (EPQ) which presents three biologically-based independent dimensions of temperament: Extraversion/introversion, neuroticism/stability, psychoticism/socialization.
The SPSS statistical package was used to store and analyse the data.

Results: The sample consisted of 64 males (mean age=48.9±9.7) and 42 females (mean age=50.7±10.9). There were not significant differences between the two groups concerning baseline characteristics as well as blood pressure measurements (office and ambulatory). Hypertensive male subjects present significantly higher levels of psychoticism (p=0.003) and neuroticism (p=0.04) compared to hypertensive females. Comparison between the 2 groups regarding extroversion revealed no statistically significant difference (p=0.4).

Conclusions: The present findings suggest that personality traits play an important role concerning gender differences in newly diagnosed essential hypertension. The differences in personality traits between hypertensive men and women should be considered in the management of newly diagnosed hypertensive patients.

PP.45.15 SOCIOECONOMIC STATUS AND HYPERTENSION AMONG ADULTS IN AN URBAN SETTLEMENT (KIBERA) IN NAIROBI, KENYA

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Objective: Using education, occupation and wealth index as socioeconomic measures, we examined the association between socio economic status and hypertension among adult residents of an urban settlement (Kibera) in Nairobi, Kenya.

Design and method: We conducted a community based cross-sectional survey among 1528 adults aged 35-64 years using the modified World Health Organization STEPwise approach to surveillance of chronic disease. Multivariable log-binomial regression models were used to estimate associations between socio economic status and hypertension . Body Mass Index was included into the model as it mediates the association between socio economic status and hypertension.

Results: The prevalence of hypertension was 27% (95% CI 27-29) with substantial variations across the age groups (18%, 35% and 52 %: 35-44, 45-54 and 55-64, respectively). We observed significantly higher prevalence of hypertension among participants with no formal education 34.3% compared to those with at least some primary (24.7%), secondary (26.3%) or tertiary (25.6%) education ($p<0.05$). Prevalence of hypertension for unemployed participants and those engaged in casual employment (28.8%) was similar to that observed for in participants engaged in formal (26.7%) or self-employment (25.7%). Among five wealth quintiles, prevalence of hypertension was highest amongst persons in the 5th (richest) quintile 32.9%. Compared to participants with normal weights, overweight (PRR=1.4, [95% CI: 1.14, 1.73]) and obese participants (PRR=1.6, [95% CI: 1.28, 2.04] were more likely to have hypertension. The model adjusted for age and gender indicated no association between all the SES measures and hypertension. However, when BMI was added to the model, having at least primary education reduced the risk for hypertension by 17%, (RR =0.83 [95% CI: 0.69-0.99]), as compared to those who had no education at all.

Conclusions: Hypertension among the urban poor adults cannot be solely attributed to SES. Further study is needed to determine whether marginal increases in wealth are associated with adoption of habits associated with increased risk for hypertension.

PP.45.16 EVALUATION OF THE PARAMETERS OF THE EURO QOL-5D QUESTIONNAIRE UNDER NORMAL CLINICAL PRACTICE CONDITIONS ON HYPERTENSIVE PATIENTS WITH NORMAL AND ELEVATED BMI

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Objective: The epidemic of obesity and obesity-related hypertension is an important public health challenge, increasing worldwide and paralleled by growing

incidence of metabolic syndrome. The psychological impact of these chronic conditions can be very disturbing. In practical terms the functional effect of an illness and its therapy upon a patient, as perceived by the patient- could be estimated by introducing the qualitative approach of - 'Health Related Quality of Life (HRQoL).
The aim of this study is to evaluate the impact of obesity on the quality of life of hypertensive patients.

Design and method: Randomized questionnaire based cross-sectional study was conducted in the Department of Cardiology, University Hospital. 130 patients with hypertension, stratified by age, sex and BMI (normal weight 18.5–24.9; overweight 25–29.9, obese 30-35) were chosen at random. Inclusion Criteria: Patients with diagnosis of essential hypertension on regular medication for at least the last 6 months. Administration of the EuroQol-5D (EQ-5D) at the time of admission of the patient. EQ-5D comprises 5 dimensions: mobility, self-care, usual activities, pain/discomfort and anxiety/depression. Each dimension has 5 levels: no problems, slight problems, moderate problems, severe problems, and extreme problems. The height, weight, smoking/non-smoking status and standard laboratory parameters were recorded.

Results: Mean age of the participants was 63.1± 12.6 years. Male/female ratio was 0.78,distribution of patients as smoker/ex smokers/nonsmoker was 20%/12.3%/67.2%. The distribution of the patients in BMI groups was 37.7%/28.5%/33.8%. Most patients had no intake of nuts in their diet. Statistically significant differences between BMI groups were seen in Usual activity (p=0.005) and Self-care (p=0.044) dimensions of EQ-5D-5L with poorest outcome in the obese. We have found significantly positive correlation between BMI and usual activities (R=0.234, p=0.001) and between age and anxiety (R=0.366 p=0.045).Mean BMI of patients with extreme problems with usual activities is significantly greater than those with lower intensity of problems. Patients with extreme anxiety tend to have higher mean age.

Conclusions: Our findings showed that individuals with obesity and hypertension had impaired QoL in terms of health, mobility, usual activity, discomfort, and anxiety. Hence, non-obese hypertensives had a better sense of overall well-being.

PP.45.17 ADJUDICATION OF DEATH IN PURE STUDY IN MALAYSIA BY VERBAL AUTOPSY

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Objective: Prospective Urban and Rural Epidemiological Study (PURE) has been conducted in Malaysia since 2007, VA is used to adjudicate death events and to classify the broad patterns of mortality occurred during the cohort follow-up.

Design and method: A group of non-medical research workers has been trained to perform VA – a systematic retrospective inquiry interviews with the family members or caretakers of imminent decedents by using a standardized and validated checklist tool. Subsequently, they were needed to describe the chronology of events, the appearance of signs and symptoms, progression of the disease, history of similar episodes in the past and the details of treatment received prior to death, if any, in a narrative VA report. To enhance accuracy, any copies of relevant supportive medical documents, if provided, were submitted together with the reports. After reviewing the VA reports, trained clinicians assigned the most likely COD based on the case definitions set by PURE study and the 10th revision of International Classification of Diseases (ICD-10).

Results: From 2009 to 2013, a total of 121 cases of death were observed in PURE cohort population of 7297 subjects. Only 23.1% deaths occurred in the hospitals and certified by medical doctors. There were 5.8% deaths (7 cases) certified by non-medical registrars as "died of old age". After adjudication for all deaths, non-communicable diseases (NCD) were the leading cause of death; representing 71.9% (87 cases) of all deaths. Cardiovascular diseases accounted for the most NCD deaths (65.5%, 57 cases), followed by cancer (28.7%, 25 cases), and diabetes mellitus (2.3%, 2 cases).

Conclusions: Cardiovascular disease is still the leading COD in Malaysia. VA is useful assessment tool to adjudicate the COD observed in PURE study. It can reduce the misclassification of COD and reduce the proportion of deaths attributed to unspecified causes.

PP.45.18 PREVALENCE OF ANXIETY, DEPRESSION, COGNITIVE IMPAIRMENT AND THEIR ASSOCIATED FACTORS AMONG MALAYSIAN ELDERS WITH HYPERTENSION IN TWO RURAL COMMUNITIES

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Objective: Hypertension is a major chronic disease which increases tremendously throughout the years especially among the elderly. It may lead to both; major and minor complications. Depression, anxiety and cognitive impairment in individuals with hypertension are associated with the poor outcomes of the disease. This study aims to determine the prevalence of depression, anxiety, and cognitive impairment among elderly patients with hypertension attending health clinics in Hilir Perak and Sabak Bernam districts besides identifying significant factors that are associated with anxiety, depression and cognitive function in the same study group.

Design and method: Cross-sectional study was carried out in six randomly selected health clinics in Hilir Perak, Perak and Sabak Bernam, Selangor of Malaysia. A total of two hundred and nine eligible consenting respondents participated in the study. The baseline socio-demographic and clinical variables were recorded through face to face interview. The anxiety and depression symptoms were assessed using validated hospital anxiety and depressive scale (HADS) while cognitive impairment function was assessed using Elderly Cognitive Assessment Questionnaire (ECAQ). Data analysis was done using x2 test, simple and multiple logistic regressions.

Results: In this study, the prevalence of anxiety, depression and cognitive impairment among the elderly patients with hypertension were 16.3%, 18.2% and 12.4% respectively. From the study, weight measurement (p=0.002) and body mass index (p=0.005) were found to be significantly associated with anxiety while cognitive impairment showed significant association with educational level (p<0.001) and age (p<0.001) of a patient.

Conclusions: Study showed relatively higher prevalence of depression rather than anxiety and cognitive impairment among the elderly hypertensive patients in Hilir Perak and Sabak Bernam districts. Our findings could help medical staff identify high risk patients with hypertension for screening of mental disorders. Education of caregivers and medical staff about old age depression may increase its rate of detection and facilitate improved treatment.

PP.45.19 SODIUM, POTASSIUM AND IODINE EXCRETION AMONG NEW ZEALAND ADULTS: IMPLICATIONS FOR PUBLIC HEALTH

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Objective: To quantify population intake of iodine, sodium and potassium in New Zealand adults to assess the best approach for a sodium reduction strategy while optimising iodine and potassium status.

Design and method: Population based survey of New Zealand Adults, using urinary excretion as an indicator of dietary intake.
Between Feb-Oct 2012, adults aged 18-64 years were randomly selected via the electoral roll from the cities of Wellington and Dunedin, New Zealand. A snowballing technique was also employed to obtain a sample size of at least 300 adults. Participants had height, weight, and blood pressure measured, and were asked to collect a 24 hour urine sample.

Results: 301 adults completed the study. Mean BMI was 26.7 kg/m2, and mean systolic blood pressure was 126mmHg. Only 23% (95% CI 18,28) of adults had an Adequate Intake of potassium, and 76% (95% CI 71,81) of adults had a sodium excretion that exceeded recommended Upper Level of intake for sodium according to relevant Nutrient Reference Values. Mean 24 hour urinary (24hU) sodium excretion was 3373 mg/day (95% CI 3208, 3539) (3833 mg/day for men and 2934 mg/day for women). Mean 24hU potassium excretion was 2728mg/day (95% CI 2611. 2844) (3005mg/day for men and 2463mg/day for women). Mean sodium potassium ratio was 1.3. The mean 24hU iodine excretion was 124 (95%CI 117,132) µg/day and 32% (95% CI 27,37) of the population had a 24hr urinary iodine excretion <100 µg/day (the Estimated Average Requirement for iodine).

Conclusions: New Zealand adults had marginal iodine intakes, high sodium intake and low potassium intake. High sodium and low potassium intakes are as-

sociated with elevated blood pressure. Public Health interventions should focus on replacing processed foods with fresh fruit and vegetables, lowering sodium concentration in processed food, and extending iodised salt use in all processed food in order to maintain iodine status.

PP.45.20 RISK FACTORS AND BLOOD PRESSURE MANAGEMENT IN XIN JIANG REGION, CHINA: A CROSS-SECTIONAL SURVEY OF 2800 HYPERTENSIVE PATIENTS

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Objective: To understand the situation regarding cardiovascular (CV) risk factors, blood pressure (BP) control and antihypertensive therapy in 4 geographic areas across Xin Jiang, China, and provide evidence for further strategies to improve hypertension management and prevent CV disease.

Design and method: 2800 primary hypertensive patients aged >=35 years selected by multistage, stratified random sampling method participated in this cross-sectional survey. All subjects completed a survey and physical examination and their medical records were reviewed. BP was measured by OMRON electronic sphygmomanometer 3 times consecutively with at least 5-minute rest before measurement for each subject. Epidata3.1 with double data entry and SPSS13.0 were used for data analysis.

Results: 1199 male and 1601 female were included in this study. Distribution across age groups were 35~44 (6%), 45~54(18%), 55~64(30%), 65~74 (32%) and >=75 (14%) years respectively. Male subjects were more likely to self-report being current smoker (24%) and consuming alcohol (strong liquor) (17%). For total survey population, the percentage of subjects with average daily edible oil consumption >25 g was 78%. The prevalence of overweight, obesity and central obesity was 42%, 32% and 85%. 78% of the study population was under antihypertensive therapy and 70% self-reported taking medication regularly. BP goal (<140/90 mmHg) was achieved in 29% of patients. Furthermore, disparities were shown among the 4 geographic areas in treatment and BP control rate. The treatment rate ranged from 93% to 52%, and BP control rate ranged from 39% to 14%, with Ku Che area being the lowest both for treatment and control rate.

Conclusions: Overall BP control rate in the 4 geographic areas across Xin Jiang is sub optimal and the prevalence of CV risk factors is high within the population with hypertension. Hypertension is the leading risk factor for CV-related and all-cause mortality and improving BP control should be a priority for health system improvement. The most common modifiable CV risk factors are overweight, obesity, as well as smoking and alcohol consumption in males: these should be the priority for further prevention strategies. Ku Che area needs the most attention.

PP.45.21 THE RELATION BETWEEN HYPERTENSION AND DIFFERENT DEMOGRAPHIC DATA AMONG HYPERTENSIVE SUDANESE PATIENTS

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Objective: This study aimed to detect the relation between hypertension and certain demographic data in Sudanese hypertensive patients.

Design and method: This study was a cross-sectional study. Data was collected from 222 hypertensive patients via structured questionnaire and analysed using Software Package for Statistical Analysis.

Results: With conform to the international pattern in which males are more affected by hypertension than females (males 66.2% , females 33.8%). The most affected age group was 41- 60 (61.1%). The most affected geographical area was the North (62.3%) followed by the East (23.9%), and the least affected region was found to be the South (6.6 %). Married subjects were more than singles constituting 89.2% of the total study population, although the study doesn't denote whether the diagnosis of hypertension was made before or after marriage. 93.2% of the study sample lived with their families. The study revealed that only 71.6% of the study sample had good compliance to treatment and scheduled physician visits, and that within those, patients with negative family history (who constituted 28.4% of the total study population) showed better compliance to treatment and scheduled follow up visits (78.04% of the patients with negative family history) than those with positive family history where 67.8% of them showed better compliance. The study shows that married patients showed better levels of compliance 73.13% than single patients. Possibly due to better access to medical service, patients originating from the north showed better compliance (70.45%) than those living in other regions of the Sudan. Disregard to origin most patients lived in desert environments (97.67% of those originating from the North and 66.66% of these originating from the East).

Conclusions: As the study shows, patients who live in stressful environments must be given information on stress and its effect in increasing blood pressure and development of hypertension and its complications, as patients originating from the East showed lower compliance, they must be targeted for health-educational programs to increase awareness. Efforts must be made to study the relation between the above mentioned variables and their contribution to the development of hypertension.

PP.45.22 BLOOD PRESSURE CONTROL AND USE OF ANTIHYPERTENSIVE MEDICATIONS AMONG PATIENTS WITH CHRONIC KIDNEY DISEASE IN PAKISTAN

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Objective: To screen adults aged >=40 years for chronic kidney disease (CKD) and assess the existing management of these patients for blood pressure control, and use of antihypertensive medications.

Design and method: It was a cross-sectional study conducted on 2873 adult participants from low- and middle-income communities in Karachi. CKD was defined as estimated glomerular filtration rate (eGFR) <60 mL/min/1.73 m² estimated by CKD-EPI Pakistan (modified CKD-EPI with correction factor, 0.686 × CKD-EPI^{1.059}) or urinary albumin to creatinine ratio >=3.4 mg/mmol. KDIGO (Kidney Disease Improving Global Outcomes) 2012 Clinical Practice Guideline based disease-specific definition of hypertension in CKD (BP >140/90 or BP >130/80 mm Hg for those with UACR < 3.4 mg/mmol and >= 3.4 mg/mmol, respectively) was used to define the condition.

Results: Among 359 (12.5%) individuals with CKD, 267 (74.4%, 95% CI: 69.5 – 78.8%) had concomitant hypertension. About 48.7% (42.6 – 54.9%) of these patients were on antihypertensive medications, and less than 20% had their blood pressure controlled to conventional target of <=140/90 mm Hg. Beta blockers were most commonly prescribed antihypertensive agent (16.7%, 95% CI: 11.9 – 21.1), followed by various combinations of antihypertensive medications (13.5%, 95% CI: 9.6 – 18.2%). Only 9.7% (6.5 – 13.9%) were on blockers of renin-angiotensin system.

Conclusions: CKD is common among Pakistani adults especially among older individuals with co-morbidities. The sub-optimal control of blood pressure and use of angiotensin converting enzyme inhibitors among patients with CKD highlight the need to integrate CKD prevention and management along with other non-communicable diseases in Pakistan.

PP.45.23 HYPERTENSION SCREENING AT HAIR SALONS: PRELIMINARY RESULTS OF A VOLUNTEER-BASED COMMUNITY HEALTH PROMOTION PROGRAM

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Objective: To assess the acceptance and usefulness of a hypertension (HTN) screening program for women set at local hair salons.

Design and method: We invited 22 local hair salon owners to participate to a HTN screening program which was limited to offering an automatic upper arm device (ESH 2002 validated) for blood pressure (BP) measurement at the waiting area. Each participating owner was provided with two devices, a display with instructions of use, patients' booklets about hypertension and anonymized questionnaires inquiring demographic, somatometric and clinical information. No option of referring to a hypertension specialist was available, though hair salon staff and patrons could contact the research team for advice and guidance unconditionally.

Results: Five hair salons, out of 19 that had initially accepted to participate, were randomly selected. A total of 1938 BP measurements were stored in the devices' memory, 683 questionnaires were completed and the research team was contacted 219 times within one month (see Table). Of note, the grossly estimated clientele would reach around 1600 women revealing the high degree of

acceptance of the program, though no objective index could be calculated. In total, 15% of device measurements were above high normal values and would correspond to either newly diagnosed HNT (second measurement required) or to poorly controlled known HTN. It should be stressed that 53 women without HTN who completed the questionnaire had abnormal BP values, including the 29 women who also contacted the research team. It could be speculated that approximately 2% of women would be first diagnosed with HTN following the completion of the initial phase of the screening program.

Conclusions: Hypertension screening in the hair salon setting was proved to be conveniently applicable and well accepted both by owners and by customers and could lead to the new diagnosis of hypertension for 2% of the female clients. Further research is warranted to assess the effectiveness of the program.

	Device Measurements	Completed Questionnaires	Team Contacts
n	1938	683	119
mean SBP (mmHg)	138	145	148
mean DPB (mmHg)	76	83	85
history of HTN (n, %)	n/a	396 (58%)	63 (53%)
mean age (years)	n/a	48	44
SBP≥140mmHg and/or DBP≥90mmHg			
with hHTN (n, %)	n/a	97 (14%)	52 (44%)
no hHTN (n, %)	n/a	53 (8%)	29 (24%)
total	291 (15%)	150 (22%)	81 (68%)

SBP, systolic blood pressure; DBP, diastolic blood pressure; HTN, hypertension; hHTN, history of hypertension

PP.45.24 THE EFFECT OF 2-YEAR INTERVENTION ON BLOOD PRESSURE IN THE COMMUNITY OF JAPANESE SMALL ISLAND HABITANTS

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Objective: There is few report on the effect of a comprehensive intervention on blood pressure (BP) control and salt restriction in the community level. We investigated the effect of 2-year intervention on BP in the community of Japanese small island habitants.

Design and method: Subjects were 391 habitants of Oshima Island and we finally recruited 186 of them (mean age 71.38 years, women 64.0%) who completed our interventional course. At baseline, 12 months and 24 months later, we measured clinic BP, body height, and body weight. Subjects were also asked to collect their first urine in the morning to measure salt excretion and urine albumin-to-creatinine ratio (UACR). A 24-h urinary salt excretion was estimated using INTERSALT formula. As interventions, we took diet history questionnaire and provided dietary counseling by dieticians or students of the graduate school of nutrition. Continuous spreading of the educational information on 'Hypertension' and 'Salt restriction' was also made through outpatient service and community journals.

Results: Among all subjects (N=186), estimated 24-h urinary salt excretion showed a significant decrease from baseline (9.36±2.17 g/day) to 12 months (9.02±2.11 g/day, $p<0.05$), while it increased at 24 months (9.38±1.94 g/day). As a result, the percentage of those who achieved the target level of salt restriction (advocated by the Ministry of Health, Labour and Welfare, or the Japanese Society of Hypertension) did not show a significant change. On the other hand, both systolic and diastolic BP decreased significantly during the 12 and 24 months follow up period (baseline: 145±22/78±11 mmHg, 24 months: 138±17/72±11 mmHg, $p<0.01$). Among hypertensive patients (N=155), number of subjects on antihypertensive medication increased, and those under <140/90 mmHg increased significantly. The UACR also showed a significant decrease from baseline (30.8±116.6 mg/gCr) to 24 months (22.1±46.8 mg/gCr, $p<0.01$).

Conclusions: A continuous medical and nutritional intervention to the community may result in better control of hypertension, while further approach is necessary to encourage salt restriction in small island habitants.

PP.45.25 COEXISTENCE OF PM2.5 AND LOW TEMPERATURE IS ASSOCIATED WITH HIGH HOME BLOOD PRESSURE LEVEL

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Objective: The effect of fine particulate matter (PM2.5) on the relationship between temperature and BP level is not well known. We performed this study to investigate whether or not there's any interaction between temperature and PM2.5 concentration on home BP level.

Design and method: During 91 days in spring 2013 (from April 1st to June 30th), we gathered daily information of the temperature and the PM2.5 concentration in Munakata city, Japan. We created the database using all home BP data available, and matched temperature/PM2.5 data during the period above in 40 hypertensive patients. Home morning and evening SBP, DBP, pulse pressure (PP) and pulse rate (PR) were analysed. Pearson's correlation analyses were used to analyse the relationships between temperature, PM2.5 and BP/PR parameters. General Linear Model (GLM) was used to calculate the interaction between temperature and PM2.5 on home BP parameters adjusting for sex, age, and BMI.

Results: There were 40 subjects; female 52.5%; mean age 74.4±6.9 years; and mean BMI 24.2±3.6 kg/m2. Both 6AM-temperature and mean-temperature showed significant inverse associations with PM2.5 ($r=-0.28$, $p<0.001$, and $r=-0.04$, $p<0.05$). Table shows the associations between temperature, PM2.5 and BP parameters. Temperature data were inversely associated with all morning and evening home SBP/PP/PR data except for evening PP. However, PM2.5 data solely was not associated with any of these parameters. There were significant interactions between 6AM-temperature and PM2.5, and mean-temperature and PM2.5 on morning home SBP (both $p<0.01$) and on evening home SBP ($p<0.05$ and $p<0.01$). The relationship was also seen for home PP ($p<0.05$). However, there were no interactions between temperature and PM2.5 on home PR.

Table. Correlations between temperature, PM 2.5 and home BP parameters

	Morning home SBP (mmHg)	Evening home SBP (mmHg)	Morning home PP (mmHg)	Evening home PP (mmHg)	Morning home PR (bpm)	Evening home PR (bpm)
Temperature of 6 o'clock in the morning (℃)	-0.19***	-0.06**	-0.05*	0.02	-0.07***	-0.07***
Mean temperature of the day (℃)	-0.18***	-0.10***	-0.04*	0.01	-0.06**	-0.06**
PM 2.5 (μg/m³)	-0.002	-0.03	-0.01	-0.005	0.03	0.01

This table shows the correlations between temperature, fine particulate matter and home BP parameters
PM 2.5, particulate matter 2.5; PP, pulse pressure; PR, pulse rate
Values are correlation coefficients. *p<0.05, **p<0.01, ***p<0.001.

Conclusions: High concentration of PM2.5 and low temperature existing together could be associated with high home BP level. Meteorological relationship between low temperature and PM2.5 would be one of the mechanisms of it.

PP.45.26 TRENDS IN PREVALENCE, AWARENESS, TREATMENT AND CONTROL OF HYPERTENSION IN THE REPUBLIC OF SEYCHELLES (AFRICAN REGION) BETWEEN 1989 AND 2013

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Objective: We assessed the awareness, treatment and control of hypertension in the Seychelles between 1989 and 2013. In the Seychelles, heath care is free to all inhabitants within a national health system, inclusive all hypertension medications.

Design and method: Four surveys were conducted in 1989, 1994, 2004 and 2013 (Seychelles Heart Studies I, II, III and IV) in random samples of the population aged 25-64 (N >1000 and participation rate >75% in each sur-

vey). BP was measured with an oscillometric device in 2013 (Omron M3) and mercury devices (Boso) in previous surveys, with cuff width adapted to arm circumference. The mean of the second and third BP readings is considered.

Results: Results varied by age. Data at age 45-64 years are shown in the Table (*: χ <0.05).

	Men					Women				
	1989	1994	2004	2013		1989	1994	2004	2013	
n	281	261	308	259	*P*	302	278	362	317	*P*
BMI ≥30	4.7	9.2	19.4	19.7	*	30.0	37.0	43.9	44.1	*
Median MAP (mmHg)	122.4	127.0	121.2	122.2	ns	119.8	122.5	117.2	117.6	*
BP ≥140/90	60.0	67.9	57.0	53.0	*	53.3	53.4	43.9	43.0	*
BP ≥140/90 or Rx (HBP/Rx)	61.4	69.0	64.5	64.9	ns	56.9	56.7	61.0	64.0	ns
% aware (of HBP)	37.7	34.8	64.7	65.1	*	52.8	57.1	80.4	75.2	*
% treated (of aware)	39.5	61.6	60.8	75.4	*	67.5	70.9	80.0	88.4	*
% controlled (of treated)	9.4	7.5	24.5	35.7	*	18.7	14.6	36.9	50.7	*
% controlled (of HBP/Rx)	0.9	1.1	6.2	11.4	*	3.8	3.4	14.5	21.6	*

Conclusions: Median MAP (expectedly insensitive to treatment) did not increase over time despite increasing obesity prevalence. Nearly two thirds of adults aged 45-64 had hypertension (HBP or treatment): this proportion did not decrease over time, consistent with more persons being treated (including some people without confirmed HBP). BP detection, treatment and control improved markedly over time, with more favorable rates in women than men. Improved BP control (e.g. decreasing prevalence of BP >=140/90) likely partially accounts for decreasing cardiovascular mortality rates between 1989 and 2012 reported in the Seychelles. Yet, the proportion of hypertensive persons with controlled BP is still far from optimal and there is a need to further strengthen both clinical and public health approaches for BP reduction.

PP.45.27 PECTORAL ANGINA MEDICATION WITH SIDE EFFECTS IN ORAL CAVITY

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Objective: Drug-induced gingival overgrowth is a known side effect of certain chemotherapeutic agents used for the treatment of systemic disorders. Gingival enlargement induced by nifedipine, a calcium channel blocker, has been reported in human and animal studies. Candidal infections often develop because of immune suppression.

Design and method: A 51 year old male presented with a chief complaint gingival hemorrhage and difficulty in inserting his denture, noted for a period of approximately 3 months. Thorough clinical examination revealed a generalized gingival enlargement involving the mandible and maxilla. Gingival hemorrhage is noted on probing, but not to an extensive degree. Candidal hyphae were present on the oral mucosa.

Results: A thorough review of the medical history revealed the following: 5 years history of treatment for hypertension; cigarette smoking (4/day); policystic kidney with chronic kidney deficiency; 31 years of working in chemistry laboratory.
General evaluation reveals mild hypertension (180/90 mmHg), bradycardia (50 b/min), edema and venectasia in lower limbs and mild parestesis in fingers. The patient notes that he suffers from hypertension, angina and difficulty in breathing at rest. The patient is presently under treatment for his angina and, approximately 4-5 months ago he was prescribed Felodipine for this condition. Felodipine is an antianginal drug belonging to a class of pharmacological agents, the calcium channel blockers. Unfortunately, one of the adverse effects of this medication is generalized gingival hyperplasia. Clinically, the generalized gingival hyperplasia (enlargement), in most patients, appears 2 to 3 months after the initial administration of the Felodipine.

Conclusions: The main cause for gingival hyperplasia in our patient probably was drug-induced over-growth, and bacterial plaque but in a smaller degree.
The patient was advised: to keep a meticulous oral hygiene; for antianginal drug substitution; dental reevaluation and treatment.

PP.45.28 WORKING OUTCOME AFTER MYOCARDIAL INFARCTION: STUDY OF FACTORS AFFECTING THE OCCUPATIONAL REHABILITATION

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Objective: The improved ventricular function, increased functional capacity assessed in METS and the making of a cardiac rehabilitation program improves working outcome after myocardial infarction. The return to work after a myocardial infarction is conditioned by a number of clinical factors, psychological and business that may affect work performance. The aim of this work is to evaluate the working outcome three months after a myocardial infarction.

Design and method: We examined 124 patients (109 M, 15 F), working age (48 ± 11 years) with recent myocardial infarction at 3 months after hospital discharge. 72% were exposed to risk of biomechanical overload with the handling of loads, 28% administrative employees. 88% had undergone PTCA, 12% had been treated with medical therapy alone. All resumed work between 1 and 2 months after the event.
The working outcome was evaluated by the number of lost work days through the administration of the questionnaire Work Performance Scale (WPS) which allows us to study the perception of job performance and through the questionnaire HADS (Hospital Anxiety and depression Scale) to assess anxiety and/or depression presence. The clinical variables studied were the ejection fraction, functional capacity and execution of a program of cardiac rehabilitation. Statistical analysis was performed using the Student's T test for unpaired data.

Results: The WPS scores were lower in patients who had a decline in ejection fraction (EF), lower functional capacity and who had not cardiac rehabilitation. Higher scores on the HADS-anxiety questionnaire correlated with a lower EF, with a lower functional level in METS. A similar correlation for the scores of the questionnaire HADS-depression. No workday was lost in the group that had carried out the cardiac rehabilitation, with EF >= 45% and with greater functional capacity (METs> 5).

Conclusions: A lower functional capacity, a decline of EF and the non-operation of the cardiac rehabilitation are related to a worse outcome of work. The non-operation of cardiac rehabilitation is strongly associated with elevated levels of anxiety and/or depression. All of these factors must be considered by the competent doctor for the reintegration of heart disease.

PP.45.29 DIETARY HABITS AND PHYSICAL ACTIVITY OF HYPERTENSIVE PATIENTS WITH CORRELATION TO DEMOGRAPHIC DATA IN WEST SOBA, SUDAN

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Objective: Ascertain the extent of physical activity and dietary habits and possible correlation with age, gender, educational level and duration of hypertension in Sudanese hypertensive.

Design and method: A cross-sectional study, conducted in the West-Soba Health-centre on the International Day of Hypertension – May-2012. The study group compromised hypertensive patients attending the health centre for follow up., where data was collected using a structured questionnaire which and analyzed via Software Package for Statistical Analysis.

Results: The study consisted of 90 females and 49 males; all hypertensives and residing West Soba; their ages ranging between 26 years to 85 years with a mean 54.2±11.497. The study revealed that 19.7% of the sample added more than two tea spoons of salt to food per day, and more than half added only one teaspoon. Majority ate big amounts of vegetables which denoted eating vegetables besides daily salad serving; yet 1.5% ate no vegetable at all. Concerning type of meat; more than one third reported eating all types of meat; 18% ate beef only and only 10% reported eating chicken and fish only. 71% of the sample did no regular significant physical activity and only 10% performed regular physical activity more than twice per week. However; no significance relation was found between age; gender; educational level or duration of hypertension and the dietary and physical habits of the samples (p:>0.05; significance correlation p:<0.05).

Conclusions: The unhealthy habits of the hypertensive residents of West Soba are addition of salt, intake of fatty meat (red meats) and lack of physical activity.

The findings of this study suggests that further interventions should focus on health education on diet and particularly physical activity since it is not effected by economic status (Sudan; is a third world country), this of course necessitates certain strategies to so that information gets to all hypertensive patients of all ages and educational levels.

PP.45.30 HIGH NORMAL BLOOD PRESSURE TRIPLES CARDIOVASCULAR MORTALITY IN A SWEDISH POPULATION

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Objective: The aim was to investigate the risk of cardiovascular disease (CVD) associated with different blood pressure categories from optimal blood pressure to manifest hypertension. Few previous studies have investigated the complete blood pressure distribution.

Design and method: A random population sample in south-western Sweden was invited for a survey of cardiovascular risk 2002-2005. In all, 2816 subjects aged 30-75 years participated (76%). All were exposed to a physical examination including blood pressure, anthropometrics, and an OGTT. Blood pressure was categorised according to ESH/ESC guidelines from optimal (<120/<80 mm Hg, both) to high normal blood pressure (130-139/85-89 mm Hg, the highest alternative). Manifest hypertension was based on a known diagnosis, or in new cases on three blood pressure readings >=140/>=90 mm hg (one or both) with 2 weeks interval. Information on lifestyle and psychosocial characteristics was collected by validated questionnaires. Information on incident cases of CVD over a mean 8 years follow-up was collected from national registers. Fatal and nonfatal CVD comprised myocardial infarction, heart failure, arterial fibrillation, percutaneous coronary intervention, and coronary artery intervention by-pass grafting. Hazard ratios with 95% confidence intervals were estimated by Cox proportional regressions using optimal blood pressure as reference. All analyses were adjusted for differences in age, sex, BMI, HOMA-ir, ApoB/ApoA1, hs-CRP, smoking, alcohol consumption, physical activity, and education.

Results: Outcomes were equal in men and women and an interaction-term between sex and blood pressure categories was non-significant. Men and women were thus combined in further analyses. In those 1353 participants with optimal blood pressure there were 11 events (0.8%) of CVD. In 615 with normal blood pressure there were 20 events (3.3%) with a HR of 2.6 (1.06-6.47). Corresponding outcome in normal high, temporarily high, and manifest hypertension, respectively, were: 25 (8.5%), HR 3.4 (1.4-8.4); 12 (9.2%), HR 2.4 (0.8-6.8); 68 (16.4%), HR 3.6 (1.5-8.9).

Conclusions: Individuals with high normal blood pressure should be identified and advised on lifestyle changes to decrease global risk and to prevent progression to manifest hypertension. Population strategies targeting normotensive individuals should also be improved.

PP.45.31 SALTSWITCH: A SMARTPHONE APPLICATION TO HELP CONSUMERS MAKE LOWER SALT FOOD CHOICES

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Objective: Existing front-of-pack labeling (FoPL) schemes are difficult for consumers to understand and so we developed a phone app FoodSwitch to help consumers identify healthier foods in stores. As processed foods are largely responsible for excessive dietary salt intakes, and reducing salt intake is key to reducing blood pressure levels, we then adapted this app so that it could be used to help consumers select lower salt food choices in the supermarket.

Design and method: The original FoodSwitch app was based on a database containing nutritional information and barcodes for 50,000 Australian packaged foods, categorised into >850 categories., The app highlighted levels of total fat, saturated fat, sugar and salt through traffic light labels based on UK Food Standards Agency guidelines. Nutrient profiling criteria was applied to each product to calculate which items appeared as healthier choices within the app. The SaltSwitch filter was then applied so that when people scanned a product only the lowest salt options were displayed.

Results: FoodSwitch was created in January 2012 and downloaded by >400,000 users in 18mths. A SaltSwitch filter option for hypertensives was introduced in November 2012 resulting in 8,000+ downloads in the week after release. When the barcode of a food product is scanned, SaltSwitch displays the traffic light colour for total fat, saturated fat, sugar and salt. A listing of lower salt products is shown on the screen. Nutritional information for >30,000 additional products has been obtained from users through a crowd-sourcing function integrated within the application. Nutritional information for >300 products is still sent in by users each week. The app has been launched in New Zealand with huge success and will be launched in the UK in February 2014, with plans to launch in China, India and the USA by 2015.

Conclusions: SaltSwitch has enabled hypertensive consumers to more easily identify lower salt food choices. With the WHO identifying salt reduction as one of the "best buys" for population blood pressure reduction, there appears to be significant opportunity for this approach in many other countries.

PP.45.32 INFLUENCE OF HEALTH CARE IN SUMY CITY POPULATION

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Objective: Reforming the health care system in Ukraine is one of the priorities of modern social policy and an integral part of the socio-economic transformation of the Ukrainian state as a whole, as highlighted in the Economic Reform Program for 2010/2014. The main objective of the reform is to improve the health care of public health, to ensure equal and fair access of all citizens to health care of appropriate quality.
The aim of the study was to analyse the real impact of health care institutions on the state of health of Sumy city.

Design and method: The study was performed using statistical, analytical and informative method, expertise and descriptive modelling. We analysed the medical and demographic population Sumy, morbidity, disability and primary activity was investigated outpatient and inpatient facilities from the point of discharge of standard during their maximum load (January-March).

Results: The study showed that a significant positive impact, existing health care system on health Sumy were found. We observe a paradoxical phenomenon - in recent years, with increasing numbers of doctors in not achieved a significant reduction in mortality and morbidity. Increased morbidity cardiovascular diseases, particularly hypertension, malignant neoplasms and mental illness, increased mortality from tuberculosis are higher than the regional level primary disability. Along with the deterioration of the health care system in the last 10 years there were two opposite processes - increasing number of physicians (23.5%) and reducing the number of beds (34.3%).
The family doctors perform it reached 94.6% in the 'narrow' specialists barely exceeded half, and in-patient medical institutions function was performed at 60.3%. Analysis of the use of hospital beds has shown that employment rates beds in recent years, is lower than the regional and national figures (in 2011 it decreased to 313.2 days., The regional rate - 319.6 days, Ukraine - 326.9 days).

Conclusions: This study confirms the validity of reforming the health sector based on the priority of primary health care through the development of family physicians.

PP.45.33 SPATIAL VARIATIONS OF SODIUM AND POTASSIUM INTAKE IN ITALY AND ASSOCIATIONS WITH SOCIO-ECONOMIC STATUS

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Objective: Inequalities in socio-economic status (SES) translate into inequalities in health. In Britain, salt intake is higher in low SES, independently of geographic variations. We aimed to assess geographic and SES gradients in sodium (Na) and potassium (K) intake in Italy.

Design and method: We conducted an analysis on the Italian Observatory Epidemiological Cardiovascular/Health Examination Survey (OEC/HES) 2008-2012 cohort, a sample of Italian adult population (39-75y: n=4,975). 100 men and 100 women were randomly sampled in 20 Italian regions and urinary electrolytes were measured as part of the MINISAL-GIRCSI to assess the habitual dietary Na and K intake. The methods included a questionnaire covering socio-

demographic information, lifestyle, and physical activity, anthropometric measurements and a 24h urine collection. Two indicators measured SES: education and occupation. Bayesian geo-additive mixed models were used to assess the spatial effect, SES pattern and nonlinear effects of covariates of Na and K excretions via Markov Chain Monte Carlo simulations using 18 mainland regions.

Results: A significant north–south pattern of Na excretion was found from posterior probability maps after controlling for important socio-demographic factors. Participants living in southern Italy had a significantly higher Na excretion than the other regions. When compared to occupation I (top managerial occupations), occupations III and IV had, on average, a 6.5% higher Na excretion. When compared to those with a university degree, participants with primary and junior school education had, on average, a 5.9% higher Na. The SES gradient explained the spatial variation. K excretion was higher in central and in some southern regions. Those in occupation V (low-skill workers) showed, on average, a significantly 3% lower K excretion compared to occupation I. However, the SES gradient only partially explained the spatial variation.

Conclusions: Na and K intake vary across Italy. Crucially, salt intake is significantly higher in less advantaged social groups. This gradient is independent of confounders and explains the geographical variation. There are geographic and SES variations in K excretion, a bio-marker of K intake. K intake is higher in central and southern regions and is lower in low-skill workers.

PP.45.34 BLOOD PRESSURE DECREASE WITH A MOBILE PHONE-BASED SYSTEM TO SUPPORT SELF-MANAGEMENT

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Objective: The effectiveness of a mobile phone-based system for supporting self-management of hypertension was evaluated in relation to its impacts on blood pressure and to patients' own evaluations.

Design and method: Components of the system were derived in interviews with patients and clinicians and included: 1) a module for self-report of clinical outcome (blood pressure, pulse), lifestyle (medication intake, physical activity, stress) and wellbeing (general health, symptoms) variables; 2) a module for automatically delivering tailored periodic reminders and encouragements; 3) a module for enabling feedback illustrating relationships between self-report variables. The system was designed for use on all mobile phones with internet access. 50 hypertensives (age=mean 60, 48% female) were recruited from primary care and performed self-reports once daily during 8 weeks. The feedback module was accessible at any time. Patients were interviewed about their experiences during and at the end of the study.

Results: A mean decrease in systolic blood pressure of 4.9mmHg was observed between the first and last ten days of interaction with the system. Patients considered the system to be easy to use and helpful in self-managing their hypertension by generating new insights into the interrelationships of drug intake, physical activity and stress with blood pressure, symptoms and wellbeing.

Conclusions: The system seems to be a useful tool to help patients gain awareness of the interplay between clinical outcomes, lifestyle factors and wellbeing, which may ultimately lead to better self-management and thereby control of their hypertension. Analyses are currently being conducted to identify characteristics of patients who are likely to benefit most from the support system.

POSTERS' SESSION

LATE-BREAKERS POSTERS' SESSION 3

PP.LB03.01 PREDICTORS UNFAVORABLE PROGNOSIS IN PATIENTS WITH ESSENTIAL HYPERTENSION IN 20 YEARS ACCORDING GUIDELINES ESH 2013

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Objective: The aim of longitudinal study was to determine possible hemodynamic and humoral predictors unfavorable prognosis in hypertensive patients (pts) according new guideline ESH 2013 and to evaluate the occasiones of death.

Design and method: At baseline 145 patients (pts) were screened for stage 1 and 2 hypertension. Left ventricular (LV) structure were assessed by M-mode echocardiography. LV hypertrophy was defined as a LV mass index (LVMI) more 115 g/m2 in men and more 95 g/m2 in women. At the reexamination in 20 years 102 alive pts were included into the first group (gr.), in 2-nd gr. - 43 hypertensive pts died from cardiac and vascular fatal complications :stroke, acute myocardium infarction, aorta aneurysm, pulmonary thrombembolia, sudden death. These groups were identical for age (approximately 43 years), pulse rate, systolic blood pressure level at the baseline investigation.

Results: The diastolic blood pressure (DBP) was more significantly ($p<0.001$) increased in the 2-nd gr. 109,46±1,48 mm Hg than in the 1-st gr. 102,3±1,00 mm Hg at the initial examination. The normal LVMI consisted 50,5% in the 1-st gr. and 29,3% in the 2-nd gr. Results indicated a very high prevalence of LV hypertrophy (LVH) in the 2-nd gr. - 83,4% against 65,2% in the 1-st gr. ($p<0.05$). We observed concentric LVH in the 2-nd gr. more often – in twice time (1-st gr.:16,8%; 2-nd gr.: 38,1%). In group of died pts (2-nd) level cortisol of blood were significantly ($p<0.01$) higher 600,71±75,23 nmol/l than in the 1-st gr. 342,18±53,87 nmol/l.

Group patients	NLVG	CLVR	CLVH	ELVH
1-st group, %	34,7	14,7	16,8	33,7
2-nd group, %	16,7	4,8	38,1	40,5

NLVG – normal left ventricular geometry, CLVR – concentric left ventricular remodeling, CLVH – concentric left ventricular hypertrophy, ELVH – eccentric left ventricular hypertrophy.

Conclusions: Our scientific data suggest that increase DBP, LVMI, especially concentric LVH, level of cortisole are predictors unfavorable survival rate in pts with essential hypertension in a long-term (20 years) follow up.

PP.LB03.02 ASSOCIATION BETWEEN LEVELS OF ERYTHROPOIETIN AND PATHOLOGICAL CYTOKINES IN PATIENTS WITH CHRONIC HEART FAILURE AND ANEMIA

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Objective: Among the possible reasons of anemia increase of pathologic cytokines (PC) product, tumor necrosis factor –α, capable to cause either immunosuppression and lowering of erythropoietin activity, erythrocytes formation in red bone marrow and iron metabolism is of great interest .The on this relation and on regress of symptoms chronic heart failure . Purpose of investigation to study relation to levels of erythropoietin and pathological cytokine of patients in chronic heart failure with anaemic syndrome and erythropoietinic effect and security of continuous erythropoietin reseptor activator methoxy polyethilenglicol-epoietin beta its impact.

Design and method: 94 patients in chronic heart failure NYHA class 3 - 4 with a left ventricular ejection fraction of 40% or less and with anemia were included in investigation (58 males, 36 females).46 patients received traditional treatment of chronic heart failure (1 group) and 48 patients were treated additionally with erythropoietin (2 group). The reason of chronik heart failure was coronary heart disease (postinfarcticcardiosclerosis) n=45, or chronic heart disease with diabetes mellitus of the 2 -nd type n=15, with arterial hypertension n=14, or coronary heart disease+arterial hypertension+diabetes mellitus n=20. Percutaneous erythropoietin 50 IU monthly to patients without iron deficiency for a period of 6 months. Echocardiography parameters, plasma NT and pro-BNP, cytokines,erythropoietin, ferritin and 6-minute walking test were assessed at baseline and after treatment.

Results: In patients with chronic heart failure and anemia in 2 group erythropoietin treatment increased Hb levels by 22,4% ($p<0,05$) and erythropoietin serum levels by 29,3±4,3 IU/ml ($p <0,001$). Increased erythropoietin level was associated with decrease of cytokines levels. IL -1 by 36,6% ($p <0,001$), IL- 6 by 54,3% ($p <0,05$),TNF-α by 48,3% ($p <0,05$) compared with patients in 1 group.

Conclusions: Correction of anemia in patients with chronic heart failure with percutaneous methoxy poliethylen glicol epoietin injections 50 IU monthly for 6 month period to improve erythropoietin deficit and cytokines aggression and associated anemia, symptoms and quality of life.

PP.LB03.03 THE DUAL REGULATORY EFFECTS OF CALCIUM CHANNEL BLOCKERS IN SIGNAL TRANSDUCTION IN VASCULAR SMOOTH MUSCLE CELLS

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Objective: RGS2 (regulator of G-protein signaling-2)-deficient mice exhibit persistent vascular constriction and severe hypertension, and genetic variations of RGS2 occur in hypertensive patients. Moreover we have known that RGS2 mRNA expression was up regulated by angiotensin II (Ang II) stimulation in vascular smooth muscle cells (VSMC). This study was to disclose the role of calcium channel blockers (CCBs) in signal transduction through RGS2.

Design and method: VSMCs were isolated from thoracic aortas of male Wistar rats and cells between passages 4 to 6 were used at semi-confluence growth state. VSMC were incubated in azelnidipine, amolnidipine or cilnidipine (~40nM) and cells were collected. RGS2 mRNA expression was performed by real-time quantitative reverse transcription-polymerase chain reaction (QRT-PCR).

Results: Azelnidipine (~4nM and ~40nM) dose-dependently increased RGS2 mRNA expression in VSMC ($p<0.01$). On the other hand, RGS2 mRNA expression was increased with cilnidipine (~40nM) stimulation and the cells were pre-incubated with PKC inhibitor for 30 minutes, PKC inhibitor significantly decreased cilnidipine-induced RGS2 up-regulation by 50% ($p<0.05$).

Conclusions: These results suggest that CCBs decreased post-receptor signal transduction through the up-regulation of RGS2 mRNA expression and this up-regulation of RGS2 mRNA expression possibly via N-type calcium channel.

PP.LB03.04 ACUTE CARDIAC FAILURE COMPLICATED WITH ACUTE RENAL FAILURE (CARDIORENAL SYNDROME)

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Objective: The aim of our study was to evaluate the prevalence of acute renal failure in acute heart failure patients and the efficacity of different medications such as diuretics and inotropic agents in the treatement of cardiorenal syndrome.

Design and method: A representative sample of 195 patients, hospitalised in the cardiology clinic, University Hospital Center in Tirana , with acute heart failure symptoms, in 2008- 2013.
There were colected personal datas about hospitalisation period, cardiovascular risk factors, acute heart failure symptoms (dispnea in rest, exertional dispnea, ortopnoea, nocturn dispnea), angina pectoris, periferal oedema, pulmonary rales, jugular veins distention.

All patients were measured blood preasure, glicemia, creatininemia, uremia, electrolits, cholesterol, HDL- cholesterol, LDL- cholesterol, Triglicertides, BMI. All patients underwent ECG examination and echografic examination.

Results: Overall the prevalence of acute renal failure in acute heart failure patients was 22.6% (44/195).
It was higher in man than in woman, respectively 73% and 26,7%.
It was not found significant association between ejection fraction and the presence of acute renal failure.
It was observed diminution of the creatinine leves in patients treated with diuretics (p = 0,01987) compared with patients that didn' t use diuretics.
It was not found significant association between creatinine levels and the use of inotropic agents.

Conclusions: In our study the prevalence of acute renal failure in acute heart failure patients was 22, 6% aproximately that reported in other similar studies (19- 45%) and it was higher in patients aged 50- 70 years old.
The use of diuretics is very important in the improvement of renal function, evaluated with creatinine blood levels.
Inotropic drug are useful in the relief of heart failure symptoms but they are not significant in the acute renal failure prognosis.

PP.LB03.05 METABOLISM DISORDERS AS FACTOR OF ENDOTOXEMIA IN GERIATRIC PATIENTS WITH CORONARY HEART DISEASE

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Objective: Nowadays the role of endotoxemia in the pathogenesis of many diseases, which leads to a change in reactivity or acts as an independent syndrome, is studied intensively. It is important the development and use of diagnostic approaches for the study of biochemical mechanisms of endotoxemia in elderly patients with coronary heart disease (CHD) against the background of adjuvant therapy, which was the aim of our work.

Design and method: It was provided clinical and laboratory observations among 91 elderly patients diagnosed with coronary artery disease: stable angina (60 patients received combined therapy with the use of pentoxifylline and 31 people who received standard therapy). Clinical material (blood plasma) was picked via venopunction using blood systems Monovette (Sarstedt, Germany) with an anticoagulant K-EDTA. The level of moleculas with average weight (MAW), malondialdehyde (MDA), lipid peroxidation (LPO) and catalase and uric acid (UC) was determined with a standard set of reagents on biochemical analyzer Metrolab 1600-DR (Argentina).

Results: Investigations of the treatment dynamics in elderly patients with CHD showed the increasing of biochemical markers of endotoxemia: MAW, UC, lipids and prooxidant status indicators - MDA, LPO. Disorder of antioxidant status is determined not only through the increasing of pro-oxidant, but also through reducing the antioxidant status via lowering of catalase level. Treatment with purine metabolism activator -pentoxifylline caused the improvement of investigated biochemical marker indexes, comparing to the control group.

Conclusions: Results obtained during clinical studies of endotoxemia in elderly patients with CHD have shown that endogenous intoxication leads to the development of severe disease. Studies of endotoxemia is an important step to recovery, because allow to detect the risk of pathological conditions on the early stages of the disease, which makes it possible to take the necessary measures to prevent the development of disease and the leveling its consequences on the early stages.

PP.LB03.06 IMPACT OF VALSARTAN 160 MG ON OFFICE BLOOD PRESURE, ABPM AND HBPM IN CHINESE PATIENTS WITH MILD TO MODERATE HYPERTENSION

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Objective: Recently, measurement of BP out of the clinical office has received a lot of attention. A few clinical trials have reported 160 mg as starting dose of valsartan. The goal of the present study was to determine the efficacy and safety of valsartan 160 mg in Chinese hypertensive patients.

Design and method: This prospective, multi-centre, open-label, single treatment group study included outpatients who had mild to moderate essential hypertension. Patients were naïve to hypertension treatment or were on antihypertensive monotherapy with MSSBP<160 mmHg and MSDBP<100 mmHg. They received a 2-week treatment of valsartan 80 mg per day, followed by 160 mg per day for the remaining 8 weeks. The primary efficacy variables included change in office MSSBP/MSDBP at week 10 from week 2 and week 0.

Results: 195 patients were included in intent to treat (ITT) population, and 179 completed. The average age was 52.9 years. At week 10, change in MSSBP/MSDBP compared with baseline was -15.6 /-11.1 mmHg (P<0.001), while the change was -4.6 /-2.2 mmHg (P<0.001) when compared with week 2. The reduction on average of 24-hour ABPM was -6.1 /-4.4 mmHg (P<0.0001) and the reduction in HBPM was -13.3 /-9.1 mmHg (P<0.0001). At week 2, control rate of office BP was 40.5%, which increased to 56.9% at week 10. After 10-week treatment, the control rate of SBP/DBP using 24h ABPM increased to 23.4%. The control rate of HBPM was 66.7% at week 10 compared to 26.1% at baseline, and was 80.4% among the patients whose office BP reached the goal. The proportion of patients who transformed from non-dipper into dipper was 41.2% (P<0.05) at week 10. After 10 -week treatment, 75.0% of patients with initial evidence of morning BP surge at baseline did not demonstrate a morning BP surge. The incidence of drug related AEs was 3.1%, and the number of AEs leading to discontinuation was 1.5%.

Conclusions: This study demonstrated that valsartan 80 mg-160 mg was well tolerated and significantly reduced office BP, 24h ABPM, as well as HBPM in Chinese patients with mild to moderate hypertension.

PP.LB03.07 DAILY HYPERVENTILATION IN OBSTRUCTIVE SLEEP APNEA SYNDROME

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Objective: Each episode of apnea during sleep in patients with obstructive sleep apnea (OSA) is accompanied by hyperventilation, arising in response to hypoxia. Possibly, the incorrect breathing rhythm persists in the daytime as well. The purpose of our research is to detect hyperventilation in patients with OSA and to discover its relationship with various parameters of cardiopulmonary monitoring.

Design and method: The study involved 44 patients aged 33 to 75 years (mean 53.86±10.09 years) with mild to severe stages of OSA. There were 21 women and 23 men. The cardiopulmonary monitoring was performed to confirm the diagnosis and to clarify the severity of OSA. The screening system ApneaLink (ResMed, Germany) was used. The hyperventilation was evaluated using the determation of carbon dioxide in final portion of exhaled air (FetCO2) using the device TIDAL WAVE (Novometrix, USA). The analysis was performed using computer software Statistics 6.0. The significance level was defined as p<0.05.

Results: The hyperventilation was revealed in 79.5% of patients. The average value of FetCO2 was 4.35±0.6%. We find that the increase of OSA severity significantly leads to decrease of hyperventilation (r=0.45, p=0.01).

Conclusions: The increase of OSA severity leads to decrease of hyperventilation. We suppose that it is due to hypoventilation because of obesity and limited movement of diaphragm in such patients. It is confirmed by almost all derived indicators of the OSA severity. Thus hyperventilation accompanies the cessation of breathing during sleep but does not recur in the daytime, and, moreover, with the number of episodes of apnea (AHI) of CO2 in final portion of exhaled air is close to normal.

PP.LB03.08 RELATIONSHIP BETWEEN BLOOD PRESSURE CONTROL AND RISK OF NEW ONSET ATRIAL FIBRILLATION IN ELDERLY PATIENTS WITH HYPERTENSION: LONG-TERM FOLLOW-UP AFTER CORONARY BYPASS GRAFTING PROCEDURE

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Objective: Postoperative atrial fibrillation (AF) occurs in up to 40% coronary bypass grafting (CABG) procedures.We assessed the hypothesis that blood pressure (BP) lowering therapy may decrease the incidence of new-onset AF in elderly patients with hypertension in the long-term follow up after CABG.

Design and method: A total of 380 patients>65 years with hypertension, who underwent CABG procedure were studied and devided into four groups based on mean office BP achieved: a normotensive group (n=102), a HTN group with goal BP control (n=98), HTN group with poor BP control- (n=78) and HTN group with moderate BP control (n=102). Patients were followed for 48 months.

Results: The incidence of new onset AF during 48 months was significantly higher in HTN group with poor BP control (hazard ratio: 6.02; 96% confidence interval: 2.322-18.020; p<0,001). The incidence of new onset AF depended on long-term level of BP control.

Conclusions: In the long-term follow up patients after CABG procedure, poor BP control increased the risk of new onset AF in elderly patients with hypertension.

PP.LB03.09 THE USE OF ANTHROPOMETRIC INDICATORS IN PREDICTING HYPERTENSION IN EMPLOYEES OF PUBLIC UNIVERSITY RESTAURANTS, SÃO PAULO, BRAZIL

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Objective: Evaluate the best anthropometric predictor of the determination of arterial hypertension in adults among the indexes BMI, waist-to-height ratio (WHtR) and the Body Shape Index (ABSI).

Design and method: Cross-sectional study with a universe of a Public University of São Paulo City (N = 174) restaurant employees between 21 and 65 years old. The data collection involved structured socioeconomic questionnaire, blood pressure measurement, weight, height and waist circumference. Hypertension was defined as blood pressure > or = 140/90 mmHg or use of antihypertensive medication. Analyzed which of the studied indexes, presented itself as a better predictor of hypertension in this population through analysis of Poisson regression with robust variance were performed (confidence interval = 95%), with hypertension or not the outcomes. A comparison of the adjustment of the prediction models was through the Akaike Information Criterion (AIC).

Results: The prevalence of hypertension and overweight / obesity were respectively 23.0% and 60.9%. The best predictors were the ABSI ((RP=2.20; IC95% 1.19-4.07), BMI (RP=1.07; IC95% 1.011-1.13) and the WHtR index wasn't a good predictor (RP=3.07; IC95% 0.30-52.5), as can be analyzed by its values of prevalence ratio and confidence interval. There was a slight difference between the models with BMI (AIC = 201.19) and ABSI (AIC = 202.32). There were no significant differences in model fit for predicting BMI and ABSI. Thus, BMI was found to be the best anthropometric index to predict the chance of hypertension in this population.

Conclusions: These results corroborate the fact that the BMI index is being globally accepted as a predictor of hypertension.

PP.LB03.10 THE RELATIONSHIP OF A BODY SHAPE INDEX AND CARDIOMETABOLIC RISK FACTORS IN OBESE HYPERTENSIVE PATIENTS WITH DIFFERENT DEGREES OF HYPERTENSION

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Objective: It is known that accumulation of excess fat in the abdominal cavity leads to the development of diabetes mellitus, cardiovascular diseases and, as a consequence, increases the risk of premature death. "A Body Shape Index" (ABSI) is a recently proposed index that standardizes waist circumference for body mass index (BMI) and height.
The aim of our study was to investigate the relationship between the body shape index and cardiometabolic risk factors depending on the degree of arterial hypertension.

Design and method: 102 obese hypertensive patients on average age 54.9±9.94 matched in age and sex were examined. All patients underwent clinical examination, assessment of carbohydrate and lipids metabolism and determine the level of apolipoproteins (Apo B and A-I). According to the criteria of the IDF (2005) was diagnosed abdominal obesity (AO). The patients were divided into 3 groups according to the degree of hypertension.

Results: AO was diagnosed in 80% hypertensive patients with 1st degree, in 77.36% hypertensive patients with 2nd degree, and in 84.62% hypertensive patients with 3d degree. No significant relationship between ABSI and cardiometabolic risk factors was identified in hypertensive patients with 1st degree. While positive significant correlation between ABSI and systolic blood pressure (SBP) (R=0.27; p<0.05), pulse blood pressure (PBP) (R=0.31; p<0.05) and negative significant correlation with high density lipoprotein cholesterol (HDL-C) (R=-0.31; p<0.05) in hypertensive patients with 2nd degree has been revealed. Along with this ABSI was associated with very low-density lipoprotein cholesterol (VLDL-C) (R=0.37; p<0.05), triglycerides (TG) (R=0.34; p<0.05), with levels of Apo B (R=0.38; p<0.05) and Apo B/Apo A-I ratio (R=0.34; p<0.05) in hypertensive patients with 3d degree. No significant relationships with ABSI and indicators of carbohydrate metabolism in the surveyed groups.

Conclusions: Our data suggest that ABSI is associated with hemodynamic parameters and lipid profile in obese hypertensive patients with second degree, and lipid profile and indicators lipidotransport's system in obese hypertensive patients with third degree, but is not associated with carbohydrate metabolism.

PP.LB03.11 IS A COMPLETE RIGHT BUNDLE BRANCH BLOCK WORSE THAN AN INCOMPLETE ONE?

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Objective: To evaluate the risk in terms of cardiovascular morbi-mortality imposed by an incomplete right bundle branch block in comparison to a complete right bundle branch block.

Design and method: Design, scope and primary care framework or level, selection criteria, number of included subjects, number of responding subjects and number of dropouts, interventions (if applicable), response evaluation variables and methods. Statistical analysis, limitations, ethical-legal aspects.
Retrospective cohort study.
Population: 288 patients treated in an urban healthcare centre who did not have any cardiovascular disease at basepoint, and who underwent some sort of ECG between 2000 and 2013, as a result of which a right bundle branch block (RBBB) was found.
Variables: age; gender; presence of cardiovascular risk factors (CRF): arterial hypertension, hyperlipidemia, diabetes; presence of a complete or incomplete RBBB; cardiovascular accidents (CVA): heart failure, coronary heart disease, cerebrovascular disease, auricular fibrillation; mortality.

Results: 53.5% of patients (n=153) were male, the average age was 64.26 (SD:18).69.8% (n=201) had an incomplete RBBB, whereas 30.2% (n=87) showed a complete RBBB. The average of those with an incomplete RBBB was 60.71 (SD:17.8), that of those with a complete RBBB 70.78 (SD:16.4).
13.4% (n=27) of patients with an incomplete RBBB, and 20.7% (n=18) of those with a complete RBBB suffered from some CVA, but the differences between the groups were not statistically significant (p=0,119; OR: 1,68; IC 95%; 0,87 to 3,25). As regards the deaths, 3.5% (n=7) of patients with an incomplete RBBB died, and 11.5% (n=10) of those with a complete RBBB (p=0.008; OR: 3.60; IC 95%; 1.32 to 9.80). Adjusted for age and cardiovascular risk factors, the risk of death was 2.27 (IC 95%; 0,63; 8,14).

Conclusions: No differences were found in terms of the risk of suffering a cardiovascular accident or the risk of death between patients with a complete right bundle branch block and those with an incomplete RBBB.

PP.LB03.12 CARDIOVASCULAR MORBI-MORTALITY ASSOCIATED WITH RIGHT BUNDLE BRANCH BLOCK

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Objective: To assess the risks involved with right bundle branch block (RBBB) in cardiovascular morbi-mortality.

Design and method: Study: Retrospective Cohort.
Population: 1,531 patients treated at an urban health center who underwent an electrocardiogram (ECG) between 2000 and 2013, and who did not with present any cardiovascular disease at baseline.
Variables: Age, gender, presence of cardiovascular risk factors (hypertension (HTN), diabetes (DM), dyslipidemia), presence or absence of RBBB, mortality and cardiovascular events (CVE), such as Heart failure (HF), coronary heart disease (CHD) and cerebral vascular accident (CVA).

Results: 47.9% were male, with an average age of 63.6 years (SD: 17.6), and 19.5% had a RBBB.
Follow-up time was 5.6 years (SD 2.8, min 0.7, max 13.9).
11.1% (n = 171) patients suffered some CVE and 3.9% (n = 60) died during the follow-up time.
In comparison to patients who presented a normal ECG at all times, patients with an RBBB had an odds ratio (OR) of 1.68 of suffering a CVE (Confidence interval (CI) of 95%, 1.17 to 2.42). This risk was 1.57 after adjusting for age, gender, HTN and DM (CI 95%, 1.07 to 2.31).
The HF OR was 2.01 (CI 95%, 1.10 to 3.70), the CHD OR 1.4 (CI 95%, 0.7 to 2.8), and the CVA OR 1.14 (CI 95%, 0.6 to 2.19).
The risk of death in patients with RBBB was 1.8 (CI 95%, 1.03 to 3.23). This risk was slightly lower after adjusting for age, HTN, and DM (OR 1.7, CI 95%, 0.9 to 3,2).

Conclusions: Patients with an RBBB have a higher risk of suffering a cardiovascular event (especially, heart failure) compared to patients with a normal ECG. The risk of death was slightly higher, although not statistically significant, in patients with an RBBB.

PP.LB03.13 VALIDATION ACCORDING TO ESH INTERNATIONAL PROTOCOL OF SOMNOTOUCH NIBP, A DEVICE FOR NONINVASIVE CONTINUOUS BLOOD PRESSURE MONITORING

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Objective: Conventional 24h ambulatory blood pressure (BP) monitoring has several important limitations including discontinuous nature of BP measurements and poor acceptance by many patients due to discomfort associated with repeated cuff inflations. This discomfort may affect nocturnal sleep quality, potentially leading to spurious elevation of nocturnal BP. Somnotouch NIBP is a novel cuffless continuous BP monitor, based on pulse transit time (PTT) measurement. Aim of this study was to assess its validity in accordance with ESH International Protocol (IP), 2010 revision.

Design and method: Somnotouch NIBP (Somnomedics, Germany) estimates BP based on the PTT measurement derived from simultaneous recording of ECG and finger photoplethysmogram. Based on the arterial wall stress-strain characteristics a function was derived linking changes in transmural pressure with PTT (BP increase translates into arterial wall stiffening and PTT is consequently reduced). Validation of the device was performed according to ESH IP (comparison with ausculatory method, mercury manometer) adapted to the peculiar characteristics of the device. In particular, as the device requires initial calibration with cuff measurement, a 15 minute interval between calibration and validation measurements was introduced to verify calibration maintenance.

Results: The study included 33 patients (age range 25-78, M/F 22/11, arm circumference 20-32cm) from low, medium and high BP strata as required by IP. All validation requirements of the IP were fulfilled (Table). The device was well accepted and no major technical problems were encountered although movement artefacts remain a relevant issue as for oscillometric monitors.

Table. Summary of validation outcome. Columns A,B,C report number of differences between reference and tested devices (out of a total of 99 differences) in systolic (S) and diastolic (D) BP, for each of the 3 BP difference ranges. Columns D and E report number of subjects with 2 out of 3 (D) or 0 out of 3 (E) BP differences ≤5 mmHg. For detailed validation requirements see O'Brien E. et al. Blood Pressure Monitoring 2010;15:23-38.

Requirement:	A ≤ 5 mmHg	B ≤ 10 mmHg	C ≤ 15 mmHg	D 2/3 ≤5mmHg **	E 0/3 ≤5mmHg ***	Result
Required	*73[a] or 65[b] **	*87[a] or 81[b] **	*96[a] or 93[b] **	*≥ 24*	*≤ 3*	
SBP – achieved	76	91	95	28	2	PASS
DBP – achieved	93	99	99	32	0	PASS

* - two out of three criteria (columns A,B,C) must be fulfilled for threshold *a*; three out of three criteria must be fulfilled for threshold *b*

Conclusions: Somnotouch NIBP fulfils ESH IP validity requirements and represents a potentially useful option for cuffless 24 h BP monitoring with lesser interference with nocturnal sleep compared with traditional cuff-based BP monitoring methods.

PP.LB03.14 EVALUATION OF BLOOD PRESSURE RESPONSES TO TREADMILL EXERCISE TEST IN NORMOTENSIVE OFFSPRINGS OF HYPERTENSIVE PARENTS

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Objective: Hypertension (HT) is a progressive disease with a prehypertensive phase of the disease. The most important feature of this period is the abnormal cardiovascular reactivity to various stressors. Therefore, in our study, we focused on normotensive children of hypertensive parents (NCHP) which is a special group under risk and planned to evaluate these children in various age groups. To explore this issue, we studied whether or not NCHP show higher cardiovascular reactivity at different steps of exercise test and recovery period from their negative history counterparts.

Design and method: This study enrolled 110 normotensive children aged 6-18 years. Sixty-two children with parental history of hypertension formed the NCHP group while 48 without parental history formed the control group (NCNP).

Results: Gender, age, weight, height and body mass index showed no statistical difference between the groups (p>0.05). Exercise test was performed to all participants according to the Bruce protocol. Resting systolic blood pressure (SBP), stage-2 SBP, stage-3 SBP, maximal SBP and SBP at 1st, 3rd and 6th minutes of recovery period were significantly higher in the study group than in the control group (respectively p=0,001, p=0,001, p=0,009, p=0,007, p=0,02, p=0,001 and p=0,001). Maximal and submaximal heart rate and blood pressure variability according to the resting values were showed no statistical difference between the groups (p>0.05). When the age groups were compared, no statistically significant differences were found between the measurements of 6-10 age group. After 10 years of age, with begining of puberty, it was noticed that NCHP group showed significantly higher SBP levels than the control group.

Conclusions: In our study, we stated that children who are at risk of HT showed more exaggerated cardiovascular responses during the test and recovery period to physical stress created by exercise testing. This response was particularly evident after 10 years of age. Before the development of HT, identification of high risk individuals make it possible to prevent or delay the emergence of the disease by some dietary and lifestyle modifications.

PP.LB03.15 DECREASED LEVEL OF CORD BLOOD CIRCULATING ENDOTHELIAL COLONYFORMING CELLS IN PREECLAMPSIA

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Objective: Preeclampsia is a pregnancy-related disorder associated with increased cardiovascular risk for the offspring. Endothelial colony-forming cells (ECFCs) are a subset of circulating endothelial progenitor cells that participate in the formation of vasculature during development. However, the effect of preeclampsia on fetal levels of ECFCs is largely unknown. In this study, we sought to determine whether cord blood ECFC abundance and function are altered in preeclampsia.

Design and method: We conducted a prospective cohort study that included women with normal (n=35) and preeclamptic (n=15) pregnancies. We measured ECFC levels in the umbilical cord blood of neonates and characterized ECFC phenotype, cloning-forming ability, proliferation and migration towards VEGF-A and FGF-2, in vitro formation of capillary-like structures, and in vivo vasculogenic ability in immunodeficient mice.

Results: We found that the level of cord blood ECFCs was statistically lower in preeclampsia than in control pregnancies (P = .04), a reduction that was independent of other obstetric factors. In addition, cord blood ECFCs from preeclamptic pregnancies required more time to emerge in culture than control ECFCs. However, once derived in culture, ECFC function was deemed normal and highly similar between preeclampsia and control, including the ability to form vascular networks in vivo.

Conclusions: This study demonstrates that preeclampsia affects ECFC abundance in neonates. A reduced level of ECFCs during preeclamptic pregnancies may contribute to an increased risk of developing future cardiovascular events.

PP.LB03.16 HYPERTENSION AND OBESITY CO-EXIST PROBLEMS IN CHILDREN

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Objective: High blood pressure in children and adolescents is a growing health problem that is often overlooked by physicians. This study aimed to identify these risk factors for cardiovascular disease in children.

Design and method: This was a community base cross sectional study in a representative stratified and randomly selected children of urban area (6-18 years old) from 16 cities in northern Iran. Clinical and anthropometric variables and family history were taken by trained research team. Children with high blood pressure in first visit, schedule for two another visits and mean of blood pressure was recorded for them. Abnormal cutoff for blood pressure and laboratory results have been determined base on standard reference.

Results: Out of 453 children sampled, 54.1% was male and 44.4% was above 14years old. 18% children had family history of hypertension. The risk of overweight and obesity was greater in older subjects as 2.45 %, 10.1% and 20.6% in under 10 years, 10 -14 years and more than 14 years old respectively($p<0.001$). Hypertension was observed in 7.1% of children that was higher in older children.

Conclusions: These findings should be considered in preventive measures to reduce the future risk for cardiovascular diseases among children in this area.

PP.LB03.17 ONE THIRD OF TOMORROW'S DOCTORS ARE AT HIGH RISK OF DEVELOPING NON COMMUNICABLE DISEASES: A CROSS SECTIONAL STUDY AMONG MEDICAL STUDENTS FROM A DEVELOPING COUNTRY

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Objective: The objective of this study was to assess the prevalence of modifiable risk factors of major Non Communicable Diseases (NCDs) among the third year medical students of Kathmandu Valley in Nepal.

Design and method: This was a cross sectional study using a simple random sampling technique to select 3 medical colleges. All the third year medical students (n=191) from the selected medial colleges were participated in the study.

Results: In this study, 62.3% were male and 37.7% were female. The mean age of the respondents was 21.5±1.0 (sd) years. One fifth (n=39) of medical students were current tobacco users and 29.3% (56) were current alcohol drinkers. Majority (85.6%) of medical students did not consume recommended level of fruits and vegetables. One third (n=59) of medical students were involved in low level of physical activity and 42.9 %(n=82) were involved in moderate level of physical activity. A total of 7.3% (n=14) respondents did not have any risk factors considered in our analysis, 60.2% (n=115) had only one risk factor and 32.4% (n=62) had two or more than two risk factors of NCDs.

Conclusions: Almost one-third of medical students were found with two or more risk factors for NCDs showing one third of tomorrow's doctors are at high risk of developing NCDs. Considering the evidence that more risk factors put them at higher risk of non-communicable diseases; interventions are needed to change unhealthy behavior among medical students.

PP.LB03.18 EFFECT OF STOCK MARKET INDICES ON BLOOD PRESSURE CONTROL AND MORTALITY

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Objective: There exists evidence of a consistent relationship between the strength of the economy and the health of the population. There are no studies examining the relationship between stock markets and cardiovascular measures at an individual level. As blood pressure is closely linked to stress, it is plausible that fluctuations in the financial markets can have an impact on blood pressure and we hypothesise that this will have an impact on blood pressure control and outcomes in treated hypertensive patients attending the Glasgow Blood Pressure Clinic.

Design and method: Financial stress was calculated as the cumulative sum of daily FTSE-100 in 5000 units over the 7 days (FTSE-5K-7d) preceding the clinic visit, hospital admission and death. The period of study was 2001 to 2011 the period of maximum stock market fluctuations. Longitudinal BP measurements over a 4 year period at least 1 month apart and excluding the first visit BP was analysed using Generalised Estimating Equations and cause specific outcomes were analysed using binary logistic regression adjusted for relevant baseline covariates.

Results: The longitudinal BP analysis included 1030 patients and 3921 blood pressure measurements, while the outcome analysis included 865 IHD and 1913 non-IHD events. The mean age was 57(14) years, baseline BP 160/95 (26/13). The mean inter-visit interval was 2.6 (2.4) months. The average FTSE-5K-7d was 7.27(1.12). Each unit increase in FTSE-5K-7d was associated with a 1 mmHg lower SBP in addition to the 0.14 mmHg monthly SBP reduction observed in the patients. There was no significant association with diastolic BP. Each unit increase in FTSE-5K-7d was associated with reduced risk of IHD events during the study period (O.R=0.925; 95% CI=0.867. 0.987; p=0.019) and this was independent of deprivation scores.

Conclusions: We show for the first time that short term stock market fluctuation is a significant predictor of BP control and IHD events at an individual level. This suggests more intensive cardiovascular prevention measures may be required during periods of economic turmoil.

PP.LB03.19 CHRONIC FATIGUE SYNDROME VERSUS DEPRESSIVE DISEASE. HOW IMPORTANT IS BLOOD PRESSURE!

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Objective: Assessment of blood pressure in 109 patients aged between 20 and 50 years, suffering from clinical depression - depressive syndrome unspecified - evolution with less three years.

Design and method: Of 109 patients admitted, 97 (89%) were female with a mean age of 24 years ranging between 20 and 44 years old, and 82 (75,2%) had between 20 and 37 years old and the remaining 27 (24,7%) are aged overdose 44years. 101 patients (92,6%) were aware of a family history of cardiovascular risk factores (CRF), and 36 (33%) were known to have hypotension.

Results: 71 patients (65.1%) had mean values of systolic blood pressure of 92 mmHg (range between 102 and 82 mmHg) and diastolic blood pressure of 52 mmHg (ranging between 68 and 47 mmHg). The other 22 patients (20.2%) with mean values of systolic blood pressure of 110 mmHg (range between 122 And 102) with an average diastolic blood pressure of 70 mmHg (ranging between 78 And 62 mmHg). Values were confirmed by AMBP.
ECG and echocardiography are normal in all patients, verifying TILT teste positive in all 38 (53,5%) of patients screened.

Conclusions: It's very important an early differential diagnosis of Chronic fatigue syndrome (CFS) and depressive syndrome, either by immediate therapeutic requirements and to establish a proper prognosis for the patients.

PP.LB03.20 METABOLIC DISORDERS, DEPRESSIVE SYNDROME AND CARDIOVASCULAR DISEASE

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Objective: 189 patients with psychiatric depressive syndrome and metabolic changes. Therapeutic response.

Design and method: 189 patients admitted consulting with family and personal cardiovascular risk factores, metabolic changes and several years of orientation in Psichyatry.
Started treatment with serotonin reuptake inhibitors, statin, lifestyle modification, with frequent optimization and adjustment of therapy.

Results: 78% with an excellent response, gaining autonomy, adequate sleep, arterial normotension, advantages in lipidic and metabolic profile in patients aged between 20 and 35 years old, 66% of the total, of both sexes
The remaining 22% found the case patients aged 35 to 50 years of wich 92% are men and 8%women.

Conclusions: There is a statistically significant relationship beetwen depressive syndrome and cardiovascular changes in metabolism with response to therapy beetwen the diferente age groupes studied and even varying between gender.

PP.LB03.21 DEPRESSION AND CARDIOVASCULAR DISEASES. WHAT'S THE LINK?

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Objective: Evaluation methabolic and cardiovascular diseases in 189 depression patients with Psichyatric diagnosis, who we found a significant correlation between this with family cerebro, cardiovascular and Methabolic diseases.

Design and method: All the patients done a cardiovascular, clinical, anthropometric and biochymical study, and we begin the medical therapeutic with SSRI and statins and methabolic therapeutics with changes in the lifestyle after Duplex scanning and verify in follow up the Clinical evolution, cholesterol HDL and Cholesterol LDL with anothers inflamatory factors and carótide and vertebral EcoDopler.
We know from clinical, anatómical and pathophysiological observation that the disease first start in the posterolateral aspect of the bulb and, in this earliest form it Is a fibrous plaque that as a uniform and smooth covering. As the begining of the lesions progress where by the time the plaque envolves entire bulb and the origin of the external carotid artery as well

Results: We found a good response with SSRI and statins with methabolic therapeutics and lifestyle changes because 98% have rise cholesterol HDL, anothers inflamatory factors and carótide changes where we know from clinical observation that the disease first start in the posterolateral aspect of the bulb and, in this earliest form it Is a fibrous plaque that as a uniform and smooth covering. We have an excellent behaviorial response.
With this results, that depression syndrome can be predictive to Cardio and Cerebrovascular methabolic diseases, where the high-grade lesions are the most dangerous and are the ones that we most be able to detect with a high degree of accuracy.
We alloways found a good correlation between hypotension (poor iintravascular pressure) and the change properties of tha arteries as a dramatic effect in the shape of the arterial pressure waveform!

Conclusions: Depression syndrome can be predictive to Cardio and Cerebrovascular methabolic diseases, where the high-grade lesions are the most dangerous and are the ones that we most be able to detect with a high degree of accuracy.

PP.LB03.22 RELATION BETWEEN WHITE COAT EFFECT WITHIN A SINGLE VISIT AND STROKE. A CROSS SECTIONAL STUDY FROM BEIJING

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Objective: Blood pressure variability (BPV) has been identified as an important new risk factor for cardiovascular events. White coat effect (WCE), measured as the first systolic blood pressure (SBP) measurement minus the mean of the second and the third measurements, is a type of BPV within a single visit. We investigated the relationship between WCE and stroke risk in this study.

Design and method: 2972 participants who had 3 measurements of BP within one single visit were included. Participants were divided into three groups according to their WCE percentiles: Group 1 (WCE2.5-97.5, 2.5-97.5th percentiles of WCE), Group 2 (WCE2.5, 0-2.4th percentiles of WCE) and Group 3 (WCE97.5, 97.6-100th percentiles of WCE). A multiple logistic regression model was used to analyze the relationship between WCE and stroke adjusted for age and BMI groups, gender, smoking status, hypercholesterolemia, SBP, hypertension, diabetes mellitus, IMT thickening, brachial-ankle pulse wave velocity (baPWV) abnormality and carotid plaque.

Results: Traditional risk factors, such as age, gender, hypertension, diabetes, and obesity were related to stroke ($p<0.05$). CIMT thickening, carotid plaque, baPWV abnormality were also related to stroke ($p<0.05$). Compared to WCE2.5-97.5 group, the OR for stroke in WCE2.5 group was 2.78 (95%CI: 1.22, 6.36, $p=0.015$). After adjusting for age and BMI groups, gender, SBP, diabetes, hypertension, hypercholesterolemia, smoking status, cIMT thickening, carotid plaque and ba-PWV abnormality, the correlation became stronger, OR increased to 2.94 (95%CI: 1.16, 7.50, $p=0.023$).

Conclusions: WCE2.5 is associated with stroke independently, further studies are needed to be conducted to assess the cause and effect relationship.

PP.LB03.23 PATIENTS' ACCEPTANCE AND PREFERENCE FOR AMBULATORY BLOOD PRESSURE MONITORING IN LIMASSOL, CYPRUS

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Objective: To investigate patients' attitude towards ambulatory blood pressure monitoring (ABPM), especially after recommendation from NICE to perform ABPM in every newly- diagnosed hypertensive patient.

Design and method: We created a questionnaire, after extensive literature review, concerning ABPM acceptance, tolerance and side effects. Answers were in Likert scale (not at all, little, medium, quite a lot, very much). ABPM and Home Blood Pressure Monitoring (HBPM) were both offered to our patients. We asked which method they prefer, for follow up examination. Study population consisted of 103 patients referred to our department for blood pressure evaluation, from November 2013 until April, 2014. The device used for ABPM was Tonoport V.

Results: Patients mean age was 53.8 years (standard deviation=14.3). All patients agreed to ABPM and HBPM. None refused answering the questionnaire. One patient failed to complete ABPM. Only 30% completed HBPM, for various reasons (forgot to measure blood pressure, forgot to bring the results, did not have time to measure blood pressure). Sixty five patients (64.5%) preferred ABPM to HBPM, which was contradictive to findings from previous research. Fourteen patients (13.5%), showed equal preference to both methods and 22% preferred HBPM for reevaluation. Eighty patients (79%) experienced minimal movement restriction and only 4.5% found it quite a lot or very restrictive. Eighty four patients (83.5%) felt restriction to every-day activities and only 4.5% found it quite a lot or very restrictive. Ninety seven patients (96.5%) didn't find the noise annoying. Eighty one patients (80%) had no or little problem with sleep and 14 (13.5%) had severe problem. Seven patients (6.5%) felt like talking it off during night time and four during day time. Five (4.5%) had medium and 4.5% had more than medium pain locally. Five had medium and quite a lot irritation, none had more severe. One mentioned medium and one quite a lot of bruises. 92.5% had no or little objection to do ABPM again. Ninety-nine patients (98.5%) believed it was not a waste of time.

Conclusions: Our patients seem to prefer an once-and-for all examination, whose most serious side effect is sleep disturbance.

PP.LB03.24 INDICATIONS OF THE EXAMINATION AND RESULTS TO PATIENT'S TREATMENT AFTER ESTIMATION OF BLOOD PRESSURE WITH AMBULATORY BLOOD PRESSURE MONITORING IN LIMASSOL, CYPRUS

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Objective: We assessed the reasons to perform Ambulatory Blood Pressure Monitoring in our office and how the examination influenced treatment.

Table 1. Reason for testing and Result to treatment

Reason for testing	N %	Result to treatment	N%
First diagnosis	18,5%	Start medication	16,5%
Out of target	38,5%	Stop medication	0%
Resistant hypertension	7%	Adjust medication	43,5%
Marginal values	21,5%	Current treatment	21,5%
Suspicion for WC effect	10,5%	Avoid starting medication	9,5%
Suspicion for MH	2%	Referral to reevaluation	9%
Other reason	2%		

Table 2. Marginal values

Marginal values	N%
Start medication	9%
Adjust medication	36,5%
Current treatment	27,5%
Avoid starting medication	18%
Referral to reevaluation	9%

Table 3. First diagnosis

First diagnosis	N%
Start medication	57.5%
Avoid starting medication	5.25%
Referral to reevaluation	31.5%

Table 4. Suspicion for WC effect

Suspicion for WC effect	N %
Start medication	18%
Current treatment	36%
Avoid starting medication	36%

Design and method: One hundred and two patients were recruited, age 18 to 85, mean=53.8, SD=14.3.ABPM had been performed in the previous six months, from November 2013 until April, 2014. The patients' reason for referring was stated by their physician (first diagnosed, out of goal, resistant hypertension, marginal values, white-coat suspicion, masked hypertension suspicion, other reason). The decision to change treatment was taken based on the results of ABPM and patients' risk stratification.

Results: There were seven reasons we performed ABPM in Limassol's General Hospital outpatient department for hypertensive and this is how the exam affected treatment (t.1). 1. The most common reason (38,5%), was having office blood pressure values out of target. Twenty nine of them (74%) had their medication changed, after ABPM. Seven of them (18%) were proven to have white-coat effect and continued their medication. 2. From 22 patients (21.5%) with marginal office blood pressure values, two started medications (9%), 8 (36%) had their treatment adjusted, 6 (27%) continued their treatment, 4 (18%) avoided starting medications (18%), two (9%) were referred to reevaluation (t.2). 3. Nineteen patients (18.5%) were referred as first diagnosed with hypertension. From them, only 57.5% was started on medication and 31.5% referred for reevaluation. Only one patient had white-coat syndrome (5.25%), which is lower than knowledge from previous research (t.3). 4. From eleven patients with suspicion for white-coat effect, two (18%) were prescript medication, four (36%) continued current treatment and four avoided treatment (36%) (t.4). 5. Seven patients (6.5%) were referred for resistant hypertension. 6. Two patients were suspicious of having masked hypertension and one indeed started medication. 7. Finally, two were referred for other reason (investigation for hypotension).

Conclusions: On the whole, 44 patients (43.5%) had their treatment adjusted, based on ABPM, 10 patients (9.5%) avoided treatment and only 21.5% continued their current treatment. Ambulatory blood pressure monitoring can alter patients' treatment.

PP.LB03.25 CARDIOVASCULAR RISK FACTORS AFTER CARDIOVASCULAR EVENTS, NEGLECTED ISSUE

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Objective: Cardiovascular diseases are the first cause of death in the world and many studies revealed prognostic effect of control of risk factors after coronary events.

Design and method: In a cross sectional study, a representative sample of urban population from 16 cities in northern Iran underwent study. Represents above 20 years old were interviewed and examined by a trained research team. Then a blood sample was drawn for biochemical testing. Data analysis was done with SPSS 14 software and x^2 test was used.

Results: A total of 2028 adults aged 20-79 years were selected from the general population. 173 participants (8.5%) were known cases of cardiovascular diseases who were taking medication, with mean age of 58.7 ± 13.2 years.35.8% of cases had obesity(BMI more than 30 kg/m2) Vs 25.5% among other people($p<0.004$). Central Obesity was found among 54.1% of cases and 34.3% others ($p<0.000$). There was not any significant differences between smoking habits between two groups(11% vs 13.3%).72.3% of the patients had at least one lipid metabolism abnormality that this rate was 46.2% among other participants($p<0.000$). Blood pressure was uncontrolled in 37.3% of cases in comparison to 16.8% in others. Diabetes was diagnosed in 28.8% cases and 8.8% other persons ($p<0.000$).

Conclusions: This study shows that inadequate attention is paid to risk factors after cardiovascular events .An educational program about risk factors to patients is recommended.

PP.LB03.26 EFFECT OF VALSARTAN/AMLODIPINE ON BLOOD PRESSURE CONTROL RATES IN CHINESE PATIENTS WITH DIABETES, CHRONIC KIDNEY DISEASE OR AGE >80 YEARS

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Objective: To determine the blood pressure control rates based on the 2013 ESH/ESC hypertension guidelines in patients treated with valsartan/amlodipine that had diabetes, chronic kidney disease or were age >80y from the CHINA STATUS II study, and to assess adverse events (AEs) in patients stratified according to BP level.

Design and method: 1865 hypertensive patients with diabetes, 355 with chronic kidney disease and 746 who were very elderly (>80 years) from the CHINA STATUS II study were evaluated. All patients received 80/5 mg valsartan/amlodipine SPC for 8 weeks. Chi-square test and Student's t-test were used in comparison.

Results: After treatment with valsartan/amlodipine SPC for 8 weeks, BP levels significantly decreased in the hypertensive patients with diabetes, chronic kidney disease and the very elderly. Based on the most recent definition of BP control as per the 2013 ESH/ESC guidelines, 75.8% patients attained BP control rate in CSII. Control rates in patients with diabetes were 69.2%, 69.6% in patients with chronic kidney disease and 89.0% in patients aged >80y. The total number of adverse events in this patient population was 164. Patients with diabetes had fewer AEs with blood pressure ranging from 130-139/80-84 mmHg compared to those whose BP was <130/80 mmHg (0.04% vs 0.07%, $p = 0.0367$). Fewer adverse events were also observed in elderly patients in the higher BP range, ie., 140-150/90 mmHg compared to <140/90 mmHg (0% vs 0.09%, $p<0.001$). In addition, drug-related adverse events were also significantly greater in elderly patients with BP<140/90 mmHg compared to those with BP 140-150/90 mmHg (0.04% vs 0%, $p = 0.1076$). For patients with CKD, there was no significant difference in the incidence of adverse events in patients with BP levels 130-139/80-89 mmHg and in patients with BP levels < 130/80 mmHg (0.01% vs 0.02%).

Conclusions: According to the definitions in the 2013 ESH/ESC hypertension guidelines, the majority of hypertensive patients with diabetes, CKD and aged >80y reached their BP control rates. Fewer adverse events occurred in patients with diabetes and in those >80 years old at the less strict BP targets compared to more stringent BP goals.

PP.LB03.27 CHANGE IN SYSTOLIC BLOOD PRESSURE DURING THE FIRST WEEK OF ACUTE STROKE IS NOT ASSOCIATED WITH FUNCTIONAL STATUS AND LONG TERM MORTALITY IN THE ELDERLY

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Objective: Recently we have shown that elevated systolic blood pressure (BP) recorded by 24 hour BP monitoring (24HBPM) during the first day of acute stroke is associated in elderly patients with unfavorable outcome. We designed a study to assess, with 24H BPM, whether the change in systolic BP levels during the first week of stroke, is associated with short-term functional status and long-term mortality in elderly patients.

Design and method: We studied 150 patients with acute stroke (69 males), mean age at admission 83.6 ±5.5 years. 24H BPM was recorded within 24 hours of admission and one week after hospitalization. After 7 days, patients were assessed for functional status according to the modified Rankin Scale (mRS), and were subsequently followed for mortality up to 7.5 years (mean 1.68 ± 1.73).

Results: After 7 days, 24H systolic BP decreased from 147 ± 21 to 140 ± 20 mm Hg ($P < 0.001$). Functional status improved and mRS decreased from 4.2 to 3.7. During follow up, 87 patients (31 males and 56 females) had died. Mortality rate was higher in females (69% vs. 45%; $p<0.01$) and in patients with a history of congestive heart failure. Average systolic BP recorded by 24HBPM predicted short-term functional status and long-term mortality. The change in BP was not associated with short-term functional status and long-term mortality.

Conclusions: Despite the unfavorable effect of elevated admission 24H systolic BP in acute stroke, the change in BP during the first week of stroke is not associated with short-term functional status and long-term mortality in elderly patients.

PP.LB03.28 FUNCTIONAL AND STRUCTURAL HEART CONDITIONS ASSOCIATED WITH WHITE-COAT HYPERTENSION IN COMPARISON WITH TRUE HYPERTENSION AND NORMAL BLOOD PRESSURE STATES

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Objective: This study attempts to evaluate functional and structural cardiac states using echocardiography assessment in patients with white coat hypertension in comparison with true hypertension and normotensive conditions.

Design and method: The study population consisted of 72 individuals, aged 25 to 75 years, who were consecutively referred to the Cardiology Clinic at Shariati Hospital, Isfahan in 2013.The subjects were assigned to four groups; white-coat hypertensives (n = 20), controlled true hypertensives (n = 20), uncontrolled true hypertensives (n = 12), and a normotensive group (n = 20).

Results: Whilst the four sub-groups in the study exhibited similar gender distribution, normotensive subjects were significantly younger, but there was no discrepancy in mean age between white-coat hypertensive and other hypertensive subgroups. Univariately comparing functional and structural cardiac parameters of 'white-coat hypertensives' to other study groups revealed lower deceleration time and E' wave velocity and higher E wave velocity and left ventricular internal dimension indices compared to the other two hypertensive groups. The median of cardiac mass was higher in 'white-coat hypertensives' compared with the normotensive group (127.5 versus 101.1, p = 0.005). After adjustment for sex and age, the white-coat hypertensive group revealed differing results in two indices, E' wave velocity and IVST, when compared with the other three.

Conclusions: A number of features can be identified as being hallmarks of white coat hypertensives: specific functional and structural cardiac changes such as lower IVST in comparison with uncontrolled hypertensives; presence of diastolic dysfunction, which is not found in normotensives and greater cardiac mass than in normotensives, less than in uncontrolled hypertensives but closest to that of controlled hypertensives. As a result, although the prognosis for patients with white coat hypertension is not as grave as for those with true hypertension it is considerably worse than among the normal population.

PP.LB03.29 APELIN AS A MARKER OF AN INSULIN RESISTANCE IN PATIENTS WITH ESSENTIAL HYPERTENSION

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Objective: Aim of investigation was to estimate a serum level of apelin in patients with essential hypertension (EH) and insulin resistance (IR).

Design and method: 94 patients (pts) with EH were examined. Clinical and laboratory methods were used. Diagnosing was done according ESH 2009 guidelines. Apelin-12 plasma levels were detected using ELISA (Phoenix pharmaceuticals).

Results: Pts were age sex matched, were divided according fasting insulin into 2 groups (1 - over 12,2 mOD/ml – 57 pts; 2 - less than 12,2 mOD/ml – 37 pts). Apelin level was significantly higher in pts with EH and IR (0,32±0,22 pgr/ml) comparing to 2gr (0,21±0,09 pgr/ml) and control (0,13±0,01 pgr/ml). Apelin correlates with IR Caro index (r=-0,38; <0,05), fasting insulin (r=0,49; <0,05). In pts of 2 gr. apelin correlates with HbA1c(r=0,52<0,05). FINDRISK questionnaire results showed significantly higher data in pts with EH and IR, means increased risk of of type 2 diabetes development.

Conclusions: Insulin resistance was estimated in 54,5%. It was accompanied by overexpression of apelin, increased risk of type 2 diabetes development, pronounced changes in lipids profile and high atherogenic index. It's possible to use apelin activity as a marker of insulin resistance in patients with essential hypertension.

PP.LB03.30 GENDER FEATURES OF LEFT VENTRICULAR MYOCARDIAL REMODELING AND THE DEVELOPMENT OF CHRONIC HEART FAILURE IN PATIENTS WITH POSTINFARCTION CARDIOSCLEROSIS

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Objective: Determine gender differences in the etiology, as well as remodeling of the left ventricle (LV) in patients with chronic heart failure (CHF) and arterial hypertension (AH).

Design and method: The study included 112 patients of both sexes, aged 45 to 60 years with CHF which were examined on the basis of Azerbaijan Scientific Research Institute of Cardiology. The patients were divided into 2 groups: 1st gr. 60 males, mean age 54,8 ± 3,3 years, and 2nd gr 52 women, mean age 55,8 ± 3,1 years. To assess cardiac hemodynamics all patients underwent echocardiography using Vivid 3 GE.

Results: According to our research leading cause of heart failure in women is 50.5% of cases of hypertension, ischemic heart disease 23.7% . While in men is the undisputed leader of CHD, forming 78.3% of CHF (80.3% in men with CHF occurred after myocardial infarction). According to our research in women more often than men CHF develops type of diastolic dysfunction (DD), and left ventricular ejection fraction remained unchanged. Since DD occurs in men at 65,8% vs 76,4% of women when p <0,05. In the group of women was more common prognostic unfavorable remodeling - eccentric hypertrophy of the left ventricle: 68% vs. 54.5% among men (p <0,05), concentric left ventricular hypertrophy: 21% in women vs 19,1% (p> 0,05).

Conclusions: Patients with CHF are a number of gender-specific: the prevalence of hypertension in women, and coronary heart disease in men. While in women with CHF often recorded diastolic dysfunction and characterized by the development of prognostically adverse remodeling types: eccentric and concentric LV hypertrophy.

PP.LB03.31 ARTERIAL HYPERTENSION MODELED BY IN VITRO TREATMENT OF RED BLOOD CELLS WITH TRYPSIN

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Objective: Rheological studies of erythrocyte membrane (RBC) are useful to analyze and model the microcirculatory disturbances observed in arterial hypertension (HT). Previous studies have shown that erythrocyte anionic charge (CAE) decreases affecting intercellular interactions. The aim of this study was to model in vitro the CAE decrease observed in hypertensive patients, by mean of the digestion with trypsin. At the same time, the impact of these changes in the rheological properties of the erythrocyte membrane and in the intercellular interaction mechanism was evaluated.
Using exploratory data techniques, a comparative study of hemorheological parameters of hypertensive patients with RBC normotensive donors altered by treatment in vitro with different concentrations of trypsin, was carried out in order to assess their potential contribution to the prethrtic state in these patients.

Design and method: Measurements of CAE by spectrophotometric analysis with the Alcian Blue dye were carried out to quantify the effect of trypsin on RBC. Erythrocyte aggregation kinetics was analyzed with an Erythroaggregameter determining the time required to reach 50% of maximum RBC aggregation (t50%).

Results: Results show a decrease in the CAE in erythrocytes of normotensive donors enzymatically treated (p<0.05) and hypertensive patients (p<0.005) compared to control. Similar EAC values of erythrocytes from HT and RBC treated with trypsin solution 2mg/mL were found. There was a significant decrease (p<0.05) in t50% with increasing trypsin concentration, yielding similar t50% values for RBCs of HT with healthy RBCs treated with trypsin solution 2mg/mL. In vitro modeling

proved to reproduce the RBC alterations in HT, establishing that 2mg/mL trypsin treatment produces similar changes to those found in this pathology.

Conclusions: The results obtained in this study indicate that alterations in the components of erythrocyte membrane by the enzymatic treatment, which has the effect of reducing in CAE, could be related to alterations present in RBC from HT. The increase in erythrocyte aggregation plays a crucial role in microcirculatory level, increasing the probability that aggregates obstruct the microcapillaries. This work represents an interdisciplinary study that allows evaluation, modeling and understanding the alterations in the erythrocyte membrane which take place in hypertension.

PP.LB03.32 HYPERTENSION IS THE MAIN FACTOR IN PATIENTS TREATED BY PCR, LONG-TERM STUDY

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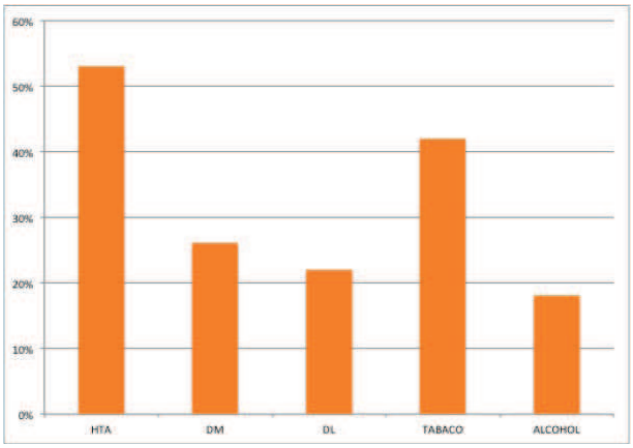
Objective: Know the main risk factors, determinants and outcomes of patients diagnosed with cardio-respiratory arrest (PCR) in our environment.



Design and method: A retrospective study of patients diagnosed with PCR is performed (on admission to hospital and / or UCI) between January 2010 until 31 December 2013 inclusive. We reviewed 453 summaries, of which only correspond to actual PCR 405 patients (89%).

Results: In 74 % of cases the etiology was cardiac ($p < 0.0131$), with 80 % PCR outpatient (home and public place) and 20% hospital, 73.8% men and 27%women, mean of 63 years. Women average 5 years older than men ($p < 0$, 059) . Among the highlights risk factors hypertension , a major factor is found in more than half of the sample, 67 % of cases: of which 53 % of patients had been diagnosed previously, while the remaining 14 % was diagnosed during hospitalization. As the second most important risk factor is smoking 42 % of cases, followed by DM diagnosed at the time of the event, 26 % of patients and dyslipidemia present in 22% of them. Significant differences in gender were found, noting that males were more smokers and drinkers, however, had less hypertension frequently. Of all hypertensive patients, 27% were male versus 40 % female.
53% of cases had a history of previous heart disease (Coronary 25.3 %, valvular disease 10%, 5 % DCM 5% hypertrophic cardiomyopathy, congenital diseases 1%). The initial rhythm in most patients was ventricular fibrillation in 83 % of cases, compared to 20 % with asystole.

Conclusions: The main FR present in most patients with PCR is the HTA. It is confirmed that a percentage of the population is not HT aware of their condition, noting a predominance in women. The PCR has a poor prognosis in the short and medium term, occurring mainly in patients with previous heart disease, hence the importance of control of CVRF.

PP.LB03.33 RELATIONSHIP OF PULSE PRESSURE INDEX AND CAROTID INTIMA-MEDIA THICKNESS IN HYPERTENSIVE ADULTS

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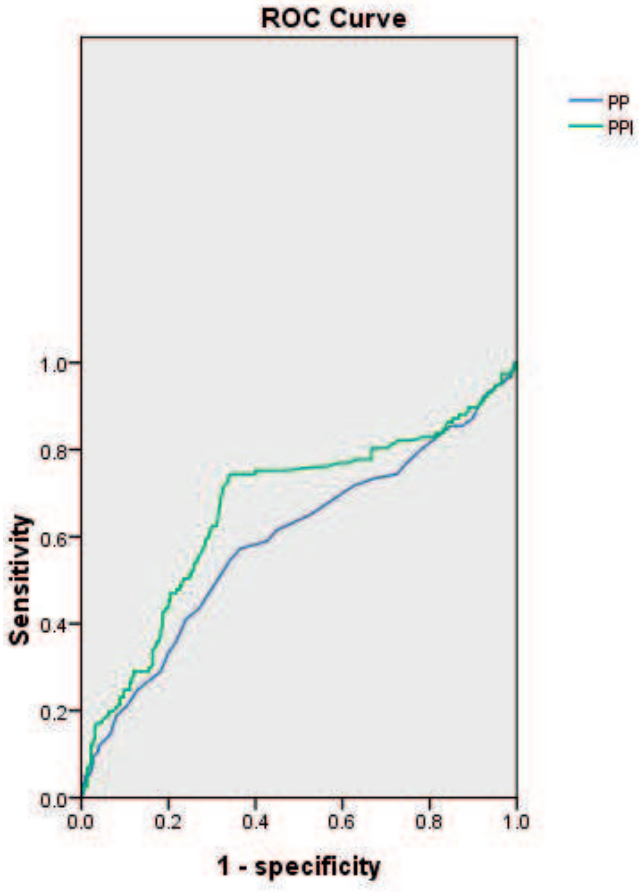
Objective: To evaluate the relationship between pulse pressure index (PPI) and carotid intima-media thickness (CIMT).

Design and method: Observational trial was design and 342 patients newly diagnosed as essential hypertension without anti-hypertensive therapy were enrolled. According to the cut-off value of CIMT, 342 participants were divided into normal (less than 0.9mm) and increased CIMT groups (equl or higher than 0.9mm). Baseline characteristics were compared, logistic regression analysis and receiver operating characteristic curve (ROC) were performed.

Results: Approximately 34.2% of participants (n=117) were with CIMT equl or higher than 0.9 mm and participants in increased CIMT group were more elderly. Diastolic blood pressure was lower in increased CIMT group than normal group (79.3±10.8 mm Hg vs 83.8±9.4 mm Hg, $P<0.001$), whereas pulse pressure (PP) (59.3±20.2 mm Hg vs 53.6±15.5 mm Hg, $P=0.004$) and PPI (0.43±0.09 vs 0.38±0.08, $P<0.001$) were significantly higher in increased CIMT group. CIMTs were 1.11±0.11 mm and 0.76±0.12 in increased group and normal group respectively ($P < 0.001$). After adjusted for the traditional risk factors for atherosclerosis such as age, smoking, body mass index, fasting blood glucose, triglyceride, LDL-C, systolic blood pressure and diastolic blood pressure, only PPI was found an independent determinant for CIMT increase, and the odd ratio was 1.644 (95% interval confidence 1.280-2.112, $P < 0.001$). The ROC evaluations showed that area under the curve for PP to predict CIMT increase was 0.591±0.034, and PPI was 0.664±0.033 (see Figure 1). PPI was more powerful than PP in discriminating CIMT increase ($P=0.006$).



Conclusions: Collectively, our study reveals that PPI is a valuable parameter for the preliminary screening of hypertensive patients who have an increased risk of atherosclerosis. In rural and remote places where echocardiography maybe not easily available, measuring PPI can provide important clues to physicians that who has already developed arterial impairment and who should undergo more thorough investigation and intensive therapy. More studies are warranted to demonstrate the predictive value of PPI for cardiovascular outcomes.

PP.LB03.34 24-HOUR AORTIC AMBULATORY BLOOD PRESSURE ASSOCIATES BETTER THAN BRACHIAL 24-HOUR AMBULATORY BLOOD PRESSURE WITH INDICES OF COMMON CAROTID ARTERY HYPERTROPHY

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Objective: Evidence suggests the superiority of aortic pressure compared to brachial pressure on the evaluation of vascular damage and prognosis of cardiovascular disease (CVD); 24-hour ambulatory blood pressure monitoring (ABPM) is regarded as the optimal method for assessing blood pressure (BP) profile. The non-invasive 24 hour aortic ABPM is now feasible and we have previously shown that 24-hour average aortic BP is associated better with left ventricular hypertrophy than 24-hour brachial BP. The aim of our study was to examine the association of 24-hour aortic and brachial ABPM with standard indices of common carotid artery hypertrophy, such as the intima media thickness (IMT) and cross sectional area (CSA).

Design and method: In 490 subjects (aged 54±13 years, 57% men, 79% hypertensives) referred for CVD risk assessment non-invasive 24-hour aortic and brachial ABPM was performed using a validated oscillometric brachial cuff-based devise (Mobil-O-Graph, IEM). Common carotid hypertrophy was assessed by high-resolution ultrasound in plaque-free segments. Linear association between BP and IMT or CSA was assessed and the Hotelling's-Williams' was used for the comparison of correlation coefficients within the same sample.

Results: The spearman correlation coefficients of systolic pressure with left/ right common carotid artery IMT and CSA are shown in the table. Comparative analysis revealed that 24-hour systolic pressure correlated significantly better than 24-hour brachial with the IMT and CSA.

Conclusions: Non-invasively assessed 24-hour average aortic pressure is strongly associated with common carotid artery IMT and CSA and better than 24-hour average brachial pressure.

Table. Spearman correlation coefficients between 24-hour brachial and aortic pressure with common carotid intimal medial thickness (IMT) and cross sectional area (CSA).

	Right IMT	Left IMT	Right CSA	Left CSA
24-h brachial SBP	0.206*	0.209*	0.255*	0.241*
24-h brachial PP	0.292*	0.235*	0.217*	0.247*
24-h aortic SBP	0.250*#	0.244*	0.309*#	0.292*#
24-h aortic PP	0.301*	0.239*	0.262*	0.288*

SBP: systolic blood pressure, PP: pulse pressure, * $p<0.001$, # $p<0.05$ for aortic versus brachial corresponding pressure using Hotelling's – Williams' T_2 test

PP.LB03.35 THE SEASONAL CHANGES OF VISIT-TO-VISIT BLOOD PRESSURE VARIABILITY IN PATIENTS WITH ARTERIAL HYPERTENSION

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Objective: The aim of study was to define the seasonal fluctuations of visit-to-visit blood pressure variability in patients with arterial hypertension (AH) in Moscow Region.

Design and method: We assessed clinical blood pressure (BP) level of AH patients (n=98) without serious concomitant diseases. We used the database of 8 studies (from 1996 until 2011), including more than 1500 measurement BP. We analyzed only those clinical BP dates that have been carried out within one season, 2-4 times in untreated patients. During the study patients completed the QL questionnaire. (J.Siegrist et all.). The mean BP (MBP) was assessed as: MBP = (1/3systolic BP)+(2/3diastolic BP). Then we calculated the arithmetic mean and SD visit-to-visit of the MBP during the 2-4 measurement BP (by M.A. Brickman method). We used ANOVA program (SAS 6.12) for statistical analysis and general Linear Model. Procedure for statistical analysis adjustment for age, sex and duration of AH and Fisher's (F) test.

Results: We obtained the following results of seasonal change of visit-to-visit variability: summer SDMBP (11,7±2,1 mm Hg) was significantly greater that winter SDMBP (6,7±1.2 mm Hg) and autumn SDMBP(6,64±1,09 mm Hg) ($p<0.05$). We found the same tendency for systolic and diastolic SDBP but the differences were not statistically significant. The VI scale scores of the QL questionnaire (level of social support of family, friends, colleagues) was associated with SDSBP ($F=4,96$, $p<0,02$).

Conclusions: In summer visit-to-visit BP variability achieve its maximum, but in winter and autumn – is lower. The quality of life scores associated with the visit-to-visit SBP variability in patients with AH in Moscow Region.

PP.LB03.36 VISIT-TO-VISIT AMBULATORY BLOOD PRESSURE VARIABILITY IS ASSOCIATED WITH DEMOGRAPHIC, SOCIAL AND PSYCHOLOGICAL FACTORS IN PATIENTS WITH ARTERIAL HYPERTENSION

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Objective: The aim of study was to define relationships between the social, psychological and demographic factors and visit-to-visit variability of the ambulatory blood pressure in patients with arterial hypertension (AH) in Moscow Region.

Design and method: We assessed 400 ambulatory blood pressure monitoring (ABPM) data (from 1996 until 2011) of AH patients (N=101) without serious concomitant diseases. ABPM monitor (Spacelabs 90207) was applied after the washout period (at 8.30-10.30 am). We defined daytime (d) period as 8.00-22.00, nighttime (n) – 0.00-6.00, evening (e) – 21.00-23.00, morning (m) – 6.00-8.00 and workplace period (w) as 11.00-19.00. Only the repeated ABPM carried out 2-4 times in 1-2 weeks were included into analysis in untreated patients The value of visit-to-visit ambulatory BP variability were determined as the average and within-patient SD (by A. Matsumoto method), separately for each period (day, night, evening, morning and workplace periods). During the study patients completed the QL questionnaire. (J.Siegrist et all.). We used General Linear Model Procedure for statistical analysis adjustment for age, sex and duration of AH and Fisher's (F) test.

Results: We found the following factors that were significantly associated with the ambulatory systolic and diastolic BP (SBP and DBP) visit-to-visit variability (SD): 1) IV scale scores of QL questionnaire (negative psychological well-being) - with SDSBPe ($F=6,71$, $p<0,01$); 2)VII scale scores (reflects the degree of ability for social contacts) with SDSBPw ($F=5,01$ $p<0,03$), SDSBPd ($F=8,88$, $p<0,003$) (negative correlation for all); 3) age with SDSBPe ($F=4,66$, $p<0,03$), SDSBPd ($F=7,26$, $p<0,009$), SDSBPw ($F=4,00$, $p<0,05$,); SDDBPd ($F=4,22$, $p<0,04$).
Thus, evening visit-to-visit variability SBP depends on the negative psychological well-being (IV scale scores), but SBP variability for day and workplace periods – on the ability for social contacts (VII scale scores). Age has been associated with the visit-to-visit ambulatory BP variability for day, workplace and evening periods.

Conclusions: The quality of life scores (negative psychological well-being, ability for social contacts) have relations with the magnitude of the ambulatory visit-to-visit variability in patients with AH. The ambulatory visit-to-visit variability increases with age.

Author Index