**MS01.1**

## Echocardiographic Predictors of Super-response to Cardiac Resynchronization Therapy

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**Introduction:** Some patients with congestive heart failure treated with cardiac resynchronization therapy (CRT) have greater improvement of cardiac remodeling after CRT and they are identified as super-responders. It remains unclear if echocardiographic cardiac dyssynchrony parameters could accurately predict super-response to CRT.
**Objectives:** To evaluate potential echocardiographic predictors related to super-response after CRT.
**Methods:** 59 CRT patients (mean age 52.9±9.0 years, 88% men) with congestive heart failure (54% ischemic and 46% non-ischemic etiology) II-IV NYHA functional class were enrolled. To assess mechanical dyssynchrony we evaluated interventricular mechanical delay, the maximum delay between peak systolic velocities of the septal and posterior walls of left ventricle, duration of left ventricular pre-ejection period (LVPEP), left ventricular and interventricular dyssynchrony by tissue Doppler imaging, systolic dyssynchrony index by 3D echocardiography. After 6 months the patients were assessed for response and classified as super-responders (reduction in left ventricular end-systolic volume (LVESV) ≥30%, n=20) and non-super-responders (reduction of LVESV <30%, n=39) and baseline data were analyzed to identify the predictors.
**Results:** Both groups demonstrated significant improvement of NYHA functional class, reduction of left ventricular ejection fraction and LVESV. All parameters of mechanical dyssynchrony at baseline were significantly higher in super-responders group. Multiple logistic regression analysis showed that LVPEP (HR 1.031; 95% CI 1.007–1.055; p=0.011) was an independent predictor for CRT super-response. In ROC curve analysis LVPEP with cut off value 147 ms demonstrated sensitivity 73.7% and specificity 75% (AUC=0.753; p=0.002) in prediction of response to CRT.
**Conclusion:** Greater mechanical dyssynchrony is associated with super-response to CRT in patients with congestive heart failure. LVPEP can be used as independent predictor of super-response.
**Disclosure of Interest:** None declared

**MS01.2**

## Identifying Mediate Adverse Events Through Deep Learning and PET Myocardial Perfusion Imaging

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**Introduction:** Deep Learning (DL) (convolutional neural networks) has boosted complex image classification, while cardiac PET imaging currently represents the reference technique for myocardial perfusion evaluation. PET provides topological summaries of quantitative perfusion across the myocardium in the form of polar maps. For clinical purposes, results from stress and the stress/rest ratio (reserve) are commonly utilized in diagnosing CAD, but the prognostic value of the entirety of such images has not been fully characterized.
**Objectives:** As we foresee the development of machine learning-based systems that aid in the individual risk estimations, we aimed to utilize DL for the identification of patients who would experience major adverse cardiovascular events (MACE) based on direct simultaneous image processing of their rest, stress and reserve PET polar maps.
**Methods:** Three polar maps per subject (rest, stress and reserve) were analyzed in 1200 patients who underwent $^{13}$N-NH$_3$ PET for suspected ischemia. We built a DL model with three polar-map inputs using pre-trained ResNet-50 neural nets. Features from the intermediate layers of each network were merged and into a final stage layer to predict the occurrence of MACE (transfer supervised learning) (i.e. MI, revascularization, cardiac death or heart failure) throughout follow-up. A 9:1 training-testing ratio and 5-fold cross validation (CV) were used. Performance was evaluated through AUC and compared to individual polar maps.
**Results:** 575 men and 625 women (68±9 years) were followed for 13.5±7months. 27% had family history of CAD, 16% of previous MI, 14% were smokers, 16% had diabetes, 33% had dyslipidemia and 51% had hypertension. Overall MACE incidence was 13%. The customized DL network demonstrated an overall CV significant AUC of 0.80±0.02 in the identification of patients who developed a MACE within follow-up. This simultaneous approach was significantly (p<0.01) better than that for rest, stress and reserve (AUCs: 0.53, 0.77 and 0.75, respectively).
**Conclusion:** Implementation of DL in simultaneous image processing of rest, stress and reserve PET myocardial perfusion polar maps seems to have prognostic value for identifying patients that will present MACE during mediate follow-up. This simultaneous DL outperforms the processing of individual maps. Further research into the clinical prognostic value of DL estimations in suspected myocardial ischemia is warranted.
**Disclosure of Interest:** None declared

**MS01.3**

## Temporal Trends in Stress Myocardial Perfusion Imaging (MPI) Studies

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**Introduction:** Previous studies showed that lower risk patients are being referred to stress testing. Few studies suggested that the frequency of abnormal myocardial perfusion imaging (MPI) studies have declined over the past two decades to even less than 10%. However, it is not clear if this is a universal observation.
**Objectives:** The aim of this analysis is to assess the temporal trends of the prevalence of abnormal and ischemic MPI studies among large consecutive cohort of Saudi Arabia's population over a period of 11 years.
**Methods:** From a high volume single center registry, we assessed all patients who undergone stress MPI studies between Octobers 2007 to June 2017 for changes in their demographics, baseline clinical information, past cardiac history, and cardiac risk factors. We also compared the trends of the frequency of abnormal and ischemic MPI. The sample was divided into 5 successive temporal subgroups for the purposes of analysis: 2007 to 2008; 2009 to 2010; 2011 to 2012; 2013 to 2014; and 2015 to 2017.
**Results:** A total of 13,786 MPI studies were analysed over the specified duration. There was a progressive decline in the prevalence of abnormal MPI in all patients, from 50.8% in 2007 to 32.3% in 2017, (P< 0.0001). Correspondingly, the prevalence of ischemic MPI declined, from 40.1% to 22.1%, (P< 0.0001). Also, there was an increase in the percentage of older patients' ≥ 65 years (40.9%). The overall rate of abnormal MPI was 41.0%, (28.2% in patients with no known coronary artery disease (CAD) and 67.6 % in patients with known CAD) and both rates were declining over time.
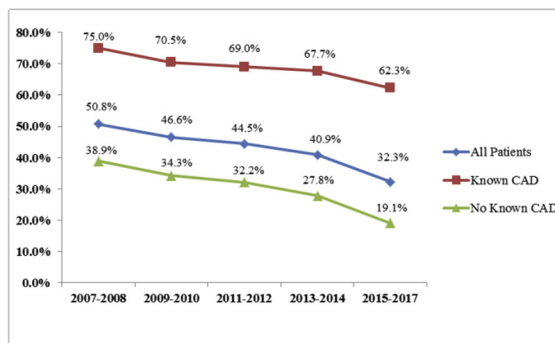

**Figure 1.** Trends in abnormal myocardial perfusion imaging studies over 11 years.

**Conclusion:** There has been a temporal decline in the prevalence of abnormal and ischemic MPI studies over a period of 11 years. However, this decline is significantly lower than the previously reported from western cohorts.
**Disclosure of Interest:** None declared

**MS02.1**

## High Prevalence of Overweight and Obesity and Associated Co-morbidities in Kenya, A Nationwide Word Health Organization Stepwise Survey

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**Introduction:** Despite the anticipated growth in the global burden of overweight/obesity especially in developing countries, limited data exist on prevalence of obesity and its associated co-morbidities in sub-Saharan Africa.
**Objectives:** We sought to determine the prevalence and correlates of overweight/obesity in Kenya. Further, we evaluated the association between obesity and co-morbidities, hypertension and diabetes.
**Methods:** We conducted the first nationwide cross-sectional survey using the standardized World Health Organization STEP-wise questionnaire for chronic disease risk factor surveillance in 2015 among Kenyans aged between 16-70 years. We collected information on socio-demographic and behaviour risk factors, anthropometric and blood pressure