Abstract: **P1542**

ECG markers of electrical myocardial instability in patients with or without coronary artery disease

Authors:
T.A. Kurilenko [1], E.V. Parmon [1], T.E. Tulintseva [1], T.V. Treshkur [1], E.V. Shlyakhto [1], E.A. Ryngach [1], M.S. Gordeeva[1], [1]Federal North-West Medical Research Centre - Saint Petersburg - Russian Federation,

Topic(s):
ECG, arrhythmia analysis, signal processing

Citation:
European Heart Journal (2015) 36 (Abstract Supplement), 250

Background: Electrical myocardial instability (EMI) markers in patients with coronary artery disease (CAD) are considered to be important in point of sudden cardiac death (SCD) risk stratification. A group of patients with ventricular arrhythmia (VA) without structural heart disease is still less studied. Appearance of VA is known to depend on autonomic nervous system modulation.

Purpose: To study the characteristics of VA: polymorphism of ventricular ectopic complexes (VEC), distribution during the day, presence of ventricular tachycardia (VT); markers of EMI: the fragmentation of QRS (fQRS) complex, microvolt T-wave alternans (mTWA) and heart rate turbulence (HRT) in patients without structural heart disease and patients with CAD.

Materials and methods: 52 patients with 500 VEC/day (28 males) were divided into 2 groups.

Group I: 27 patients without structural heart disease, mean age 42±15 years, 436±196 VEC/hour, ejection fraction (EF) 65±6% by Simpson. Structural abnormality of the heart was excluded using an ECG, echoCG, in some cases stress ECG and cardiac MRI.

Group II: 25 patients after myocardial infarction (mean age 59±11 years), VA (208±103 VEC/hour), EF 47±8% by Simpson. EMI markers were analyzed using holter ECG in both groups.

Results: In I group 59% VA was monomorphic, night type of arrhythmia was dominant (387±152 VEC/hour during the day, 495±203 VEC/hour at night, $p<0.05$), nonsustained VT was in 8% of patients. FQRS in sinus complex was not found in I group. FQRS in VEC was registered in 7% in the II, III, aVF leads. MTWA was positive in 59%. Pathological turbulence onset (TO) was in 3.7%, while turbulence slope (TS) was in the normal range.

In II group polymorphism of VEC predominated (in 84% of patients), with a day type distribution of VA (247±125 VEC/hour during the day, 140±84 VEC/hour at night, $p<0.05$). Nonsustained VT was in 25%. FQRS in sinus complex was observed in 25%. FQRS in VEC was recorded in 92% in different leads, but more often in II, III, aVF and V1-V4. MTWA was positive in 50% of patients. 25% of patients had abnormalities in TO, 16% - in TS.

Conclusion: Abnormal mTWA and TO in patients without structural heart disease suggest that an imbalance of autonomic nervous system impacts on the maintenance of EMI in this group. While the daily type of arrhythmia, nonsustained VT, QRS fragmentation, pathological mTWA and HRT indicate the presence of EMI in patients with coronary artery disease, even when EF is preserved. ECG markers combination requires further studies.