hemodynamic parameters, 12-lead rest ECG findings, results of clinical and biochemical analyses were examined; echocardiographic study and daily ECG monitoring being performed. The test with physical load was performed before the patients' discharge form the hospital on 12.2 ± 0.3 day after AMI in the average.

RESULTS Early cycle ergometry (CE) demonstrated low physical potential (≤50 W) in 51 patients (67.1%) in the whole. Further analysis of CE results was performed in subgroups by size of IM, that is, with AMI with elevation of ST segment (1st group, n=45) and without stable ST segment elevation (2nd group, n=31). There were no significant intergroup differences in parameters of loading test and integral dynamics by the size of IM. ΔDouble product% increment in patients of the 1st group (105.8±5.6%) was 1.05 times lower than the one in the 2nd group patients (111.1±5.4%). Incidence of ventricular premature beats (VPB) and its appearance during the loading test in the 1st group patients was more frequent (n=23, 51.1%; 1.74 ± 0.2) than in the 2nd group patients (n=12, 38.7%; 1.3 ± 0.17) (P>0.05). VPB of high grades (4A and 4B) were registered in 5 (11.1%) and 2 (6.5%) patients of the 1st and 2nd groups, respectively (P>0.05). Submaximal heart rate (HR) was reached in 14 (31.1%) of the 1st group patients, in 2 (11%) patients being accompanied by depression of ST segment and in one case with ST segment elevation. The target HR in the 2nd group patients was reached in the 2nd group patients less frequently (n=7, 22.6%) being accompanied neither by decline nor elevation of ST segment. Predictively unfavorable types of VPB during the loading test were registered in 2 patients (4,4%) of the 1st group, paired VPB being observed on 1-2 minutes of restitution and in none of the 2nd group patients.

CONCLUSIONS Our findings serve as one more proof of safety of loading test in patients with AMI with Q wave and without that.

GW28-e0524

Magnetocardiographic polar map image reveal regional wall motion abnormalities: comparison study with stress-echocardiography

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OBJECTIVES Magnetocardiography (MCG) is a highly reliable non-invasive technique that measures the magnetic field generated by the electrical activity of the heart. Previous studies on MCG have shown high sensitivity in detecting myocardial ischemia, especially in cases of inverse problem solution usage, e.g. 3D reconstruction of current density distribution. The bull's-eye image, also called polar map image, has been developed to visualize and to quantitate analysis of tomographic slices. The objective of this research is to evaluate whether bull's-eye image of current density distribution is useful in detecting wall motion abnormalities in patients with coronary artery disease.

METHODS 17 coronary artery disease patients without prior to myocardial infarction(mean age 52.3 ± 17.1 years)underwent dobutaminstress-echocardiography (DSE) and magnetocardiography (MCG) tests. A group of 27 healthy volunteers(mean age 41.5 ± 9 years) served as control subjects. Echocardiographic analysis of the left ventricular (LV) wall was performed according to the simplified 5-segment model, where each segment corresponded to anterior, lateral, inferior-posterior walls of LV, septal and apical zones, respectively. Systolic wall thickening and inward endocardial motion were visually evaluated, and each segment was graded on a 4-point scoring system (1 - normal; 2 - mild hypokinesis; 3 - severe hypokinesis; 4 - akinesis or dyskinesis). The MCG examination was performed using a 9-channel MCG, recording from 36 positions over the chest, in an unshielded environment. Algorithm of inverse solution for planar current distribution,based on double integral Fourier transform, was developed. Three-dimensional surface in the form of ellipsoid was used as a physical model to represent the current density, which was presented in the form of five-segment bull's-eye maps. Similar to the DSE analysis, MCG used a 4-point scoring system to evaluate the current density (1 - normal; 2-mild density reduction; 3- moderate density reduction; 4 - severe density reduction). Finally, the agreement between assignment of LV segments, obtained from DSE and MCG using 4-points scoring system, was assessed using interrater agreement statistic (kappa, k).

RESULTS The general correspondence between DSE and MCG analysis was 64%, k=0.5. High agreements were observed at the anterior (74%, k=0.61) and at the apical (71%, k=0.57) segments of LV. The agreement in inferior-posterior wall was observed to be significantly lower than the rest of the segments (39%, k=0.35).

CONCLUSIONS The presence of wall motion abnormalities in anterior and apical segments of left ventricle in CAD patients lead to decreases in the current density in these areas of LV. Therefore, 3D reconstruction of current density using MCG can be a useful tool in obtaining important diagnostic information.

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Coronary artery disease versus coronary microvascular disease: advanced analysis of magnetocardiographic maps

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OBJECTIVES The diagnostic management of patients with chest pain remains a clinical challenge. In particular, existing non-invasive techniques may lack sensitivity and specificity to differentiate between epicardial and microvascular abnormalities. Magnetocardiography (MCG) is non-invasive evaluation of the magnetic field of the heart that is produced by the electric activity of the myocardium. Previous studies have shown that magnetocardiograms reveal obvious changes in patients with coronary artery disease (CAD) and normal electrocardiogram (ECG) at rest.

The objective of this research was the investigation of MCG value in differential diagnosis of coronary artery disease and coronary microvascular disease using novel approach of magnetocardiographic current density vectors (CDV) maps evaluation based on binary classification metric.

METHODS The study included 136 patients without a history of myocardial infarction. Coronary angiography was performed because of chest pain in all subjects. Depending on the results of coronary angiography, this group was divided into two subgroups: those with at least 50% stenosis in at least one of the main coronary arteries (subgroup 1, 82 subjects) and those without hemodynamically significant stenosis (subgroup 2, 54 subjects). All patients without hemodynamically significant stenosis underwent exercise ECG test and shown ST-segment depression during exercise testing. In all participants, the MCG examination was performed using a 9-channel MCG system located in an unshielded room.

The magnetocardiography recordings were taken from 36 positions at rest. From these CDV maps were generated during the ST-T interval. Each element of CDV map was described by two parameters: brightness, which corresponds to the current density in particular point and angle of current density vector at each point. As the result, 32 features were calculated for every map. Then binary k-NN classifier with various distance metrics (Cityblock, Mahalonobis, Chebychev, Eucledian) was used to qualify the just examined patient to the investigated categories.

RESULTS The highest accuracy was demonstrated by binary k-NN classifier with Cityblock distance metric -124 (91%) patients were classified correctly. Sensitivity was 93%, specificity - 89%, positive predictive value -93% and negative predictive value -89%.

CONCLUSIONS The MCG test at rest has the potential to be useful for the differential diagnosis between coronary artery disease and coronary microvascular disease.

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New exploratory therapeutic strategies of secondary prevention of coronary heart disease

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OBJECTIVES With an effective therapeutic strategy of a patient with syndrome of cardiac cachexia, our team share what we learned from treating a typical case and give some thoughts on new exploratory therapeutic strategies of secondary prevention of coronary heart disease(CHD).