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Indicators of adrenoreactivity of erythrocyte membranes in patients with myocardial infarction and nonobstructive atherosclerosis of the coronary arteries in comparison with the control group

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Topic(s):
Acute Coronary Syndromes: Myocardial Infarction with Non-obstructive Coronary Arteries

Citation:
Background: Patients with myocardial infarction and non-obstructive atherosclerosis of the coronary arteries (MINOCA) represent a heterogeneous group of with not well known mechanisms of AMI. We hypothesized that MINOCA patients have distinctive features of sympatho-adrenal system (SAS) activation in comparison with patients with stenosis atherosclerosis which can play a significant role in the development of ischemic events. According to the literature, the method for assessing of adrenoreactivity of an organism is a method for assessing the β-adrenoreactivity of red blood cell membranes (β-AWP) to study the indicators of β-adrenoreception of cell membranes in patients with AMI and non-obstructive atherosclerosis compared with patients with AMI and single-vessel coronary artery disease.

Material and methods. The study is non-randomized open controlled. The study is registered on ClinicalTrials.gov: NCT03572023. Inclusion criteria are listed on the site. An analysis of the organism's beta-adrenergic reactivity by changing erythrocyte osmoresistance was carried out using a set of reagents BETA-ARM AGAT. The parameter β-AWP was studied upon admission, one the 2th, on the 4th and 7th day from AMI, the normal level of β-AWP <20 rel.units.

Results: The study included 40 patients with AMI (20 patients in the main and control groups), and 77.5% with STEMI. Among them the average age of patients in the main and control groups was 63.9 ± 11.9 and 60.3 ± 8.6, respectively. The risk on the GRACE scale in MINOCA patients was 8.1% (2.0; 9.0), in the control group - 4.4% (2.0; 5.0) (p> 0.05), median time of admission to the hospital - 353 min (120; 465). Upon admission an increase on cardiospecific enzymes was detected in all patients. The median β-AWP in the total sample was 43.0 (29.0; 61.6) rel. units, after 1 day - 48.6 (38.5; 57.3) rel. units, on the 4th day - 49.4 (39.0; 63.4) rel. units, 7 days - 53.6 (35.2; 67.7) rel. units (p <0.05). The average value of β-AWP in the 1st group at admission 51.9 (26.5; 61.0) rel. units, after a day - 50.4 (35.7; 56.7 ) rel. units, 4 days - 47.9 (37.0; 57.0) rel. units, 7 days - 45.2 (32.3; 69.0) rel. units, (p> 0.05 ). In the 2nd group, the average value of β-AWP at admission is 42.0 (35.0; 61.6) rel. units, in a day - 47.4 (38.5; 58.3) rel. units, 4 days - 57.0 (43.1; 69.0) rel. units, 7th day - 59.3 (41.0; 67.8), (p> 0.05). The groups did not differ statistically.

Conclusions: Thus the level of β-AWP in patients with AMI with non-obstructive atherosclerosis was 2 times higher than normal values at all control points, and comparable to the level of β-AWP in with single-vessel coronary artery disease which indicated a high level of SAS activation and decreasing of in β-adrenergic receptors amount.