Indicators of adrenergic reactivity of erythrocyte membranes in patients with myocardial infarction and nonobstructive atherosclerosis of the coronary arteries after 1 year

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Topic(s):
Myocardial Infarction with Nonobstructive Coronary Arteries (MINOCA)

Background: We hypothesized that MINOCA patients have distinctive features of sympatho-adrenal system activation in comparison with patients with stenosis atherosclerosis which can play a significant role in the development of ischemic events at the time of the index hospitalization and after 1 year.

Aim: To study the parameters of β-adrenoreception of cell membranes in patients with MINOCA compared with patients with AMI and single-vessel coronary artery disease after 1 year.

Material and methods: The study is non-randomized open controlled. Adrenergic reactivity of the body was assessed by the method for assessing the β-adrenergic reactivity of erythrocyte membranes (β-ARM) for studying the parameters of adrenergic reception of cell membranes. This parameter (β-ARM) was studied upon admission, at days 2, 4 and 7 and 1 year after AMI. The normal level of β-ARM <20 rel.units.

Results: The study included 40 patients with AMI (19 patients in the main group and 21 patients in the control group). Three patients (15.7%) with diagnosed acute myocarditis were excluded from the analysis. The median age in the main and control groups was 66 (54; 70) years and 59 (55; 65) years, respectively. These groups were different at the admission in such parameters: in smoking frequency (31.3% vs 52.3%), history of angina pectoris (62.5% vs 28.5%), time of admission to the hospital (390 min. vs 180 min.) and thrombolytic therapy at the prehospital phase (3% vs 11%), p<0.05. The median β-ARM in MINOCA patients upon admission was 41.7 (29.0; 61.5) rel. units, 1 day - 48.6 (38.5; 57.3) rel. units, 4 days - 49, 4 (39.0; 63.3) rel. units, 7 days - 53.5 (35.2; 67.7) rel. units, after 1 year - 35.7 (25.5; 42.6) rel. units. In the control group, the median β-ARM upon admission was 52.5 (25.4; 64.5) rel. units, 1 day –51.6 (28.3; 56.9) rel. units, 4 days - 48, 5 (34.9; 61.2) rel. units, 7 days - 45.1 (32.2; 68.9) rel. units, after 1 year - 20.8 (14.8; 29.3). In MINOCA patients β-ARM indices in the early postinfarction period statistically higher than the 1 year: at 1, 2, 4 days, p <0.05, on day 7 no differences were found (p = 0.34). A dynamic comparison of β-ARM indicators in the control group at the time of the index hospitalization and through 1 year revealed differences at all days early postinfarction period, p <0.05. In the control group, the β-ARM indicator reached normal values by 1-year follow-up period. In MINOCA patients, β-ARM indices after 1 year were statistically higher than in the control group, p = 0.008. Conclusions: The β-ARM indices in MINOCA patients after 1 year from the ischemic event are higher than in the control group. In dynamics, the β-ARM indices statistically decreased in the control group, but did’n change in MINOCA patients. Despite the use of a beta-blocker in MINOCA patients, increased SAS activity persists; therefore, β-APM values did’n change significantly after 1 year.