Assessment of the global work of the myocardium in myocardial infarction with ST segment elevation of various localization

Oleinikov V.; Golubeva A.; Babina A.; Babina A.; Galimskaya V.; Galimskaya V.; Burko N.; Burko N.; Donetskaya N.; Donetskaya N.; Korenkova K.; Korenkova K.

Penza State University, Penza, Russian Federation

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Purpose: To assess the degree of impairment of the global myocardial function of the left ventricle in different localization of myocardial infarction with ST segment elevation (STEMI) using speckle tracking echocardiography.

Methods: The study included 45 patients with primary STEMI aged 38 to 66 years (52.3 ± 7.4). Myocardial infarction was confirmed by ECG data, biomarkers (troponin T, CPK-MB) and by the results of coronary angiography with the presence of one infarct-related coronary artery in the absence of hemodynamically significant stenosis of other arteries. Echocardiography has been performed 7-9 days after STEMI on a Vivid GE 95 Healthcare ultrasound scanner (USA) using EchoPAC software version 202 (GE Healthcare). In the automatic mode, the indicators of myocardial work have been calculated: the index of global myocardial work (GWI, mm Hg%), Global constructive work (GCW, mm Hg%), Global wasted work (GWW, mm Hg%) %, global work efficiency (GWE,%). Statistical data processing has been performed using the Statistica 13.0 software package (StatSoft Inc., USA).

Results: Taking into account the localization of STEMI on the 7th-9th day, patients were divided into two groups: group 1, which included 29 patients (64.4%) with lesions of the anterior LV wall (LAD), group 2 - 16 patients (35.6%) with LV posterior wall infarction (RCA and CA). The comparison of the indices of global myocardial work in the two groups, has found that the GWI in group 1 was 1219 [95% CI 1053.1; 1384.9] mm Hg%, in group 2 - 1550.8 [95% CI 1371.6; 1730] mm Hg%, (p = 0.02). The GWE parameter in group 1 was 88.2 [95% CI 85.5; 90.9]%, in group 2 - 94.3 [95% CI 92; 96.6]%, (p = 0.01). The GCW index had the following values: in group 1 - 1383 [95% CI 1205.1; 1560.9] mm Hg%, in group 2 - 1805.5 [95% CI 1576.2; 2034.8] mm Hg%, (p = 0.01). GWW in group 1 was 152.8 [95% CI 94.3; 211.3] mm Hg%, in group 1b - 73.3 [95% CI 47.6; 99.0] mm Hg%, (p = 0.02).

Conclusion: Thus, the localization of STEMI is reflected in the indicators of myocardial function. LV anterior wall infarction has lower GWI, GWE, and GCW values and higher GWW values than posterior wall infarction.