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Peculiarities of the dynamics of fibrosis markers at the in-hospital stage in myocardial infarction patients with preserved left ventricular ejection fraction

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Purpose: To identify the peculiarities of the dynamics of fibrosis markers in patients with STEMI and preserved myocardial contractility and to determine the relationship between the studied biomarkers and EchoCG indicators characterizing the violation of left ventricular myocardium diastolic function.

Material and methods: The study included 120 patients with STEMI. The final analysis included 83 patients with preserved left ventricular myocardial contractility measured. The preserved ejection fraction was considered to be = 50%. Echocardiographic examination was performed using Sonos 2500. In addition to the standard laboratory and instrumental examinations, all the patients underwent the estimation of the concentrations of PICP and PIIINP by enzyme-linked immunoassay using BCM Diagnostics laboratory kits (USA) on the 1st and the 12th days of disease. To compare the obtained values of the studied markers, a control group of healthy volunteers matched by age and gender with the main sample of the patients, was recruited, n=20 (100%). In this group the following values were obtained: PIIINP 7.2 [6.8; 7.5] ng/ml, PICP 179.2 [163.5; 194.9] ng/ml. Statistical processing of the obtained data was performed using Statistica 6.0 software.

Results: The mean age of the patients was 58.8 years; LVEF was 59.0% [54; 62]. According to EchoCG data, LV dysfunction at normal dimensions was registered in 59 (72%) patients, dilatation – in 22 (27%) patients and regional contractility violation – in 43 (52.4%) cases. The increased values of Tei index 0.70 [0.63; 0.76] and myocardial mass 241.0 g [206.5; 272.0] stand out. The values of serum markers concentrations obtained on the 1st day of STEMI, significantly exceeded the values of the control group and were as follows: PIIINP 26.0 (18.9; 34.9) ng/ml (?=0.047), PICP – 609.0 (583.0; 635.0) ng/ml (?=0.049). On the 12th day the concentration of PICP - 588.0 (580.0; 621.0) ng/ml, PIIINP – 24.2 (18.6; 30.3) ng/ml. No statistically significant differences were obtained in comparison of the markers’ concentrations on the 1st and 12th days of the disease. As a result of the correlation analysis between the values of the studied serum markers and EchoCG indicators the following statistically significant relationships were identified: E/Em the 1st day - PICP the 12th day: r=0.55, p=0.005; E/A the 12th day - PIIP the 1st day: r=-0.42, p=0.033; E/Em the 12th day - PICP the 12th day: r=0.48, p=0.015; EDV the 12th day - PIIINP the 1st day: r=0.62, p=0.001; EDI the 12th day - PIIINP the 1st day: r=0.43, p=0.034; Age - PIIINP the 1st day: r=0.558, p=0.016.

Conclusion: The presence of statistically significant correlations between the concentrations of PIIINP, PICP with EchoCG indicators evidence the role of fibrosis in the formation of diastolic myocardial dysfunction and reflect the potential use of procollagen to predict heart failure in long-term post-infarction period.