The incidence of cardiotropic viruses in the myocardium in patients with acute decompensated ischemic chronic heart failure

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Background: Inflammation plays a crucial role in the progression of chronic heart failure (CHF) and its decompensation. Experimental studies have shown repeatedly that activation of inflammation in the heart provokes remodeling and left ventricular dysfunction. However, anti-inflammatory therapy widely lacks positive outcomes. However, there are no studies of molecular and cellular phenotypes of myocardial inflammation (viral, viral and autoimmune inflammatory and autoimmune type) in patients with acute decompensated chronic heart failure (ADHF) and ischemic cardiomyopathy.

The purpose of study to determine the frequency of occurrence of inflammation and the profile of cardiotropic viruses in the myocardium by endomyocardial biopsy, and immunohistochemistry analysis.

Methods: This open-label, nonrandomized, single-center, prospective trial - NCT02649517. This trial includes ADHF patients with ischemic systolic dysfunction underwent percutaneous coronary intervention/coronary artery bypass graft with optimal results not earlier than 6 months after surgery and acute coronary syndrome. Patients received standard treatment of ADHF according to ESC guidelines. All patients undergo invasive coronary angiography to exclude the progression of coronary heart disease as the cause of ADHF. Endomyocardial biopsy (EMB) and following immunohistochemical analysis were performed to determine the type of inflammation in the myocardium. The following parameters are assessed during hospitalization: inflammatory infiltrate in the myocardium.

Results: According to subanalysis of the 25 patients with ADHF hospitalized from January 2015 to May 2017 the average age was 59.8±9.3 years (16% female) and left ventricular ejection fraction was 29.17±9.4%. All of the patients underwent EMB which revealed signs of myocarditis in 16 patients (64%), including severe myocarditis in 5 cases (20%), moderate myocarditis in 4 cases (16%), mild myocarditis in 7 cases (28%), and no myocarditis in 9 patients (36%). The presence of signs of myocarditis with cardiotropic viruses was found in 16 cases (64%), cardiotropic viruses without myocarditis was in 7 cases (28%), and no signs of myocarditis with cardiotropic viruses was found in 2 cases (8%), signs of myocarditis without cardiotropic viruses was found only in 1 case (4%). Viruses in the myocardium were determined in 21 cases (84%). The most common combinations were Enterovirus with Human herpesvirus 6 in 12 patients (48%) and Enterovirus with Epstein-Barr virus in 7 patients (28%). The correlation was found between the infiltration of CD 45+ cells in the myocardium and presence of Enterovirus.

Conclusion: The frequency of occurrence of myocardial inflammation is 64%, for cardiotropic viruses in myocardium it is 84% in patients with ADHF. The most encountered viruses in myocardium were Enterovirus and Human herpesvirus 6.
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