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Modern Diagnostics in Various Forms of Chronic Heart Failure

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Abstract. Heart failure (HF) is a clinical syndrome with typical symptoms and signs developing due to a violation of the structure and (or) function of the heart, leading to the inability of the heart to provide oxygen delivery at rest or under load in accordance with the needs of the body. This pathology is becoming one of the leading problems of modern medicine and is characterized by widespread prevalence, extremely unfavorable prognosis and high financial costs. The incidence of chronic heart failure (CHF) has been steadily increasing in recent years. According to the Framingham Study, in the United States, the number of patients with CHF among people over 45 years of age is 5 million people, and the number of patients increases by 400 thousand people annually [8, 9]. According to the data of the first Russian epidemiological study on HF EPOCH, the prevalence of CHF in the European part of the Russian Federation is 12.3% [6-8].

The prognosis for patients with CHF is extremely unfavorable: according to the Rochester and Rotterdam epidemiological studies, mortality in CHF of any functional class is 50% among men and 46% — among women over a 5-year period. The social significance of CHF is determined by large financial costs. Data from pharmaco-economic studies have shown that for the treatment of patients with CHF in countries Europe and the USA spend from 2 to 3% of the total health budget, which exceeds the cost of treating coronary heart disease and all oncological diseases combined. Moreover, 70-80% of the funds account for the payment of inpatient treatment of patients with CHF. The main strategic direction in the effective treatment of patients with CHF, improving their quality of life, and reducing mortality is to identify the early stages of the disease. Treatment of patients with the latent form of CHF, regardless of the degree of myocardial dysfunction, is the most promising approach to preventing the progression of CHF and early death of patients.

Key words: an imbalance, sympathetic-adrenal, Neurohumoral, inadequate.

Materials and methods. CHF is defined as "a pathophysiological syndrome in which, as a result of a disease of the cardiovascular system, there is a decrease in pumping function, which leads to an imbalance between the hemodynamic needs of the body and the capabilities of the heart". The modern neurohumoral model of pathogenesis has proved that the development of CHF as a syndrome is a consequence of imbalance in the system of complex biochemical mechanisms of vasoconstriction and vasodilation. The root cause of such molecular changes are a direct effect on the myocardium of ischemia, pressure overload or the inflammatory process, which leads to a deterioration in the ability of the heart to fill or empty. Against this background, physiological compensatory mechanisms are triggered: activation of the renin-angiotensin-aldosterone system (RAAS), natriuretic peptide system, sympathetic-adrenal system (SAS), endothelin-1 system. Neurohumoral imbalance leads to the progression of left ventricular (LV)



dysfunction by accelerating the processes of myocardial remodeling and to a general overload of the heart. Biological mechanisms, stimulating vasodilation, diuresis and natriuresis, are aimed at reducing the pathological effect on the myocardium, but they are characterized by a fairly rapid depletion. With the progression of the disease, the activity of RAAS and CAC increases several times, which leads to persistent vasoconstriction, pronounced hemodynamic disorders, inadequate perfusion of organs and tissues at rest or under load, and often with fluid retention in the body.

Result. The key point in the diagnosis of HF is the identification of the original cause, since it determines the specificity of treatment (valvular surgery for pathology of the valvular apparatus, specific pharmacological therapy for LV systolic dysfunction, etc

Instrumental diagnostics. Echocardiography (EchoCG) Imaging plays a central role in the diagnosis of HF and the further selection of appropriate treatment. Among the many available imaging methods, EchoCG is the method of choice for patients with suspected HF, due to its accuracy, accessibility (including portability), security and cost. This method provides information about the anatomy of the heart (including the volume of cavities, geometry, mass) and its functioning (including LV function and movement of its walls, valve function, right ventricular function, pulmonary artery pressure, pericardial condition). EchoCG can be supplemented with other techniques selected according to their ability to provide answers to specific clinical questions, taking into account the contraindications and risks of these special studies. Other indicators of systolic function LV is an AV—planar systolic excursion, systolic tissue Doppler velocities and measurement of deformations (stretching and stretching level). Visualization of deformities in determining minor disturbances in LV systolic function is a more sensitive indicator in comparison with PV. However, to date, the reproducibility and standardization of the results of the deforming imaging method limit the routine clinical use of this method

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