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STUDY OF THE FUNCTIONAL STATE OF THE MYOCARDIUM IN PATIENTS WITH HYPERTENSION

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Annotation
The review presents data on the features of the formation of chronic heart failure in patients with hypertension. Modern echocardiographic methods of diagnosis of heart failure in this category of patients are considered.

Keywords: echocardiography, hypertension, speckle-tracing.

Introduction

Cardiovascular diseases rank first in the world among the causes of death of the population, which is 47%, or more than 4 million deaths per year. Hypertension (HD) is one of the most common risk factors for the occurrence of both fatal and non-fatal cardiovascular events, including myocardial infarction, cerebral stroke, heart failure, chronic kidney disease and diabetes mellitus. In real practice adequate blood pressure control can be achieved only in a third of European patients and even fewer Ukrainians [2]. Left ventricular (LV) myocardial hypertrophy with impairment its functions is a well-known complication of GB, especially in conditions inadequate antihypertensive therapy. Myocardial pressure overload leads to the development of a well-known phenomenon - concentric myocardial hypertrophy, which at the morphological level represented by an increase in cardiomyocyte in cross section. Data changes contribute to an increase in myocardial oxygen demand, and, consequently, the development of ischemia, changes in systolic and diastolic functions, arrhythmias.

Thus, the outcome of defeat heart as a target organ in hypertension - the development of chronic cardiac failure (CHF). Echocardiography (ECG) is currently the leading non-invasive method for assessing the structure and function of the heart in practical

cardiology. Quantification of dimensions heart chambers and heart function is the cornerstone of its visualization. ECG has the unique ability to provide real time image of beating hearts. Swift technological improvement, including the mergence broadband sensors, tissue harmonics, contrast agents and special software (speckle-tacking), allowed improve echo quality of cardio graphic image and grading myocardium. Echo KG makes it possible to identify impaired function, as well asassess the condition of the chambers [3]. It is well known that LV ejection fraction less than 40% indicates a significant decrease in its systolic function.

At the same time, normal values of the ejection fraction do not exclude CHF, but expansion of the LV cavity and low values of LV ejection fraction far are not always accompanied by clinical signs of CHF. It must be remembered that impaired diastolic function can develop to the appearance of systolic dysfunction. In addition, the estimate diastolic function is extremely important for diagnosis heart failure in patients with clinical symptoms and signs of CHF with preserved LV ejection fraction. Doppler echocardiography cannot measure hemodynamic parameters, but only evaluate them. Thus, the main limitation of this study is in the absence of accurate hemodynamic data. Doppler echocardiography allows identify violations of myocardial relaxation processes by assessing trans mitral diastolic flow and speed of movement mitral ring. It must be remembered that this method is indirect and does not allow us to understand the proper internal properties relaxation of the myocardium, moreover, it does not make it possible to differentiate the relationship of heart pathology with the vascular bed with an increase in filling pressure due to the dependence on preload [4]. Echocardiographic examination of patients with hypertension showed pancreatic hypertrophy. Bulgarian scientists suggest that LV hypertrophy leads to subclinical pancreatic dysfunction even in the absence of diastolic dysfunction and heart failure. Ukrainian researchers have found an increase in the size of the right atrium in hypertensive patients with normal LV contractility. A third of patients with LV concentric hypertrophy, there was a significant an increase in the thickness of the pancreas compared with individuals with normal geometry. In addition, an increase in the LV myocardial mass index inpatients with hypertension was associated with changes in the longitudinal kinetics of the myocardium.

Pathomorphological examination of the myocardium in persons suffering from hypertension, also revealed myocardial hypertrophy not only of the LV, but also of the RV in 78.2%cases [5]. According to a meta-analysis of 13 studies conducted by Italian scientists, the incidence of RV hypertrophy in hypertension amounted to 28.6%. At the same time, Russian scientists have established that the development of pancreatic hypertrophy in patients with hypertension has other reasons (the presence CHF, LV

diastolic dysfunction, change in the size of the right atria), and not arterial hypertension [6]. Thus, the presence is one of the factors contributing to the development of dysfunction right heart, along with other diseases and behavioral factors ... As you can see, heart remodeling in hypertension is more complex. Process than the development of only LV hypertrophy.

For persons with GB, in addition to LV remodeling, morphological and functional changes occur and right heart. Involvement of the pancreas when changing geometry or LV function in patients with hypertension can be explained by structural features myocardium and interventricular interaction, which consists in the relationship of the form, function and work of one ventricle with another. it provided by the continuity of muscle fibers, the presence of a general interventricular septum and a single pericardium [7].In recent years, a new method for assessing the myocardium has appeared -speckle-tracing Echo KG, which is based on modern model of the structure of the heart, proposed by F. Torrent-Guasp et al. The method allows you to quantify the indicators of the apical and basal rotations, twisting and unwinding of the heart, in a new way evaluate the physiology of contraction and relaxation. Besides study in motion parameters, speckle-tracking ECG makes it possible to study deformation properties of the myocardium. Longitudinal strain and velocity LV deformities established by speckle-tracing ECG, are highly sensitive indicators of preclinical dysfunction of the LV. The contraction of the heart along the short axis occurs to a greater extent due to the contraction of the circular muscle fibers, which allow maintaining the global function of the myocardium in case of violations of the longitudinal component.

Few studies showed that LV longitudinal function is impaired already in the early stages damage to the heart, even before the development of LV systolic dysfunction and the appearance of clinical symptoms. The circular function remains relatively safe for a long time and compensates LV contractility. Thus, it is precisely the circular the component plays a key role in maintaining the correct geometry of the LV and determines its resistance to loads on early stages of heart failure.

Progressive deterioration circular function contributes to further enlargement of the LV cavity and the progression of symptoms of heart failure [8].The pancreas has a complex geometry, its muscle fibers contract mainly in the longitudinal plane. Unlike LV, contraction occurs in the longitudinal plane with the base of the pancreas moving towards apex in systole. In one study, the free longitudinal wall strain (strain) and strain rate high correlation with the clinic, echocardiographic and received as a result of catheterization with data on RV remodeling. Vas a coal-dependent sensitive measurement of the global and regional myocardial contractility strain has an

advantage in revealing the true contractility of the free wall, and on-translational motion, potential M-mode interest, or mode of two-dimensional image of indicators of longitudinal compression.

On today the authors consider the ratio of strain / strain rate of the pancreas an early indicator of right ventricular heart failure. Today, routine echocardiography is not enough to detect predictors of CHF development. The statement of the fact of its presence is not always improves the patient's clinical prognosis. New visualization techniques will allow more detailed identification, assessment and disclosure of pathogenetic mechanisms of heart pathology [9-13]. The following are still open. Questions: search for early preclinical markers of cardiac development insufficiency in hypertension, COPD and their combination; determining whether is diastolic heart failure on its own form of heart failure or is it just a stage of development systolic heart failure [9].

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