

**DISORDERS OF THE DIASTOLIC FUNCTION OF THE LEFT VENTRICLE  
WITH CORONARY HEART DISEASE**

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**ABSTRACT:** In the last two to three decades, the possibility of preserving the ejection fraction (LV) of the left ventricle (LV) in patients with heart failure, which had not been discussed before, has been studied. Numerous studies conducted in recent years indicate a significant prevalence of heart failure with normal LV. With preserved LV, timely detection and adequate treatment of LV diastolic dysfunction (DD) comes to the fore, since relaxation processes change much earlier than they worsen systolic function. The determining factors in this process are active relaxation and pliability of the LV. Failure of at least one of these components leads to an increase in LV filling resistance and an increase in filling pressure, i.e., to a violation of diastolic function. The data reflecting the frequency of registration of types of diastolic dysfunction in individuals with coronary heart disease according to population-epidemiological studies are presented. The diastolic function of the left ventricle was studied in terms of transmittal blood flow, depending on the ejection fraction.

**Key words:** coronary heart disease; diastolic dysfunction; heart failure.

## **INTRODUCTION**

That is why disorders of LV diastolic filling are usually designated as the earliest markers that precede the detailed clinical picture of chronic heart failure (CHF). Normal diastolic function refers to the ability to LV should take the necessary amount of blood to maintain cardiac output. The main determinants of LV filling are active relaxation and compliance. Changing one of these components will lead to an increase in resistance LV filling and impaired diastolic function. And LV DD, in turn, is the inability of the LV to take in blood under low pressure and a compensatory increase in pressure in the left atrium. There are 3 main types of LV DD. Type I is a type of delayed relaxation, considered as a manifestation of moderate LV DD. Type II — pseudonormal, indicates DD LV of moderate severity and with timely detection and correction can transform into type I. Type III is restrictive, indicating severe LV DD. The listed types of transmittal changes blood flow reflects the dynamics of LV DD. The purpose of the study is to establish the frequency of types LV DD in patients with coronary heart disease (CHD).

## **MATERIALS AND METHODS OF RESEARCH**

The object of the study was a representative sample of the unorganized male population of working age in one of the mountainous regions of Uzbekistan. 1,295 people underwent primary screening, which accounted for more than 70% of the final sample formed on the basis of random numbers. At the first stage, all the examined patients had: • filling out a cardiological questionnaire (Rose), as well as a questionnaire to determine the presence of smoking and alcohol consumption habits, the degree of physical activity in accordance with the WHO protocol; • electrocardiographic examination at 12 standard leads with further coding by The Minnesota code; • anthropometry with calculation of the Quetelet index; •

determination of the concentration of total cholesterol, triglycerides and high-density lipoprotein cholesterol in blood plasma. In accordance with the requirements accepted in epidemiological studies, certain and possible forms of coronary heart disease were identified. At the second stage of the study, Doppler echocardiography was performed in all patients with some form of coronary heart disease (93 people). Measurements They were performed in M-modal and two-dimensional modes in standard echocardiographic positions, according to the recommendations of the American Echocardiographic Society with an assessment of transmittal blood flow to determine LV DD. LV diastolic function was assessed in pulse mode by the rate of transmittal flow (TMF) at the level of the fetal tract LV immediately above the site of closure of the mitral valve flaps during early (E) and late (A) diastole. The E/A ratio, deceleration time (DT) and acceleration (AT) of the flow in the fast filling phase, the time of isovolumetric relaxation (IVRT) and isovolumetric contraction (IVST) of the LV myocardium. Depending on the value of the parameters of TMP at rest, all subjects were classified as having (C.P. Appleton) normal TMP values LV (E/A = 0.75—1.5, DT = 150-200 ms); impaired relaxation — relaxation type (decrease in peak E, E/A < 0.75, DT > 200 ms); pseudonormal type (E/A = 0.75—1.5, DT = 150-200 ms); restrictive type (E/A > 1.5, DT < 150 ms). For differential diagnosis of normal and pseudonormal types of TMPS used a sample Valsalva (PV). Normally, a decrease in venous return to the heart (which is observed during the PV voltage phase) will lead to a decrease in the amplitude as a wave (E), and the waves (A) of the TMP. Thus, the ratio The E/A will remain unchanged (before and during the sample). The presence of a pseudonormal type of LV DD was recorded if the initial E/A ratio changed by more than 40% when performing PV. Statistical analysis.

## THE RESULTS AND THEIR DISCUSSION

The obtained data were subjected to statistical processing by methods of medical statistics, taking into account modern requirements. For the parametric criterion t was used for a preliminary assessment of the difference between the variation series the student and the assessment of the difference between the shares. Further, to verify and refine the results obtained in small samples, a nonparametric criterion was used — the Wilcoxon (Mann-Whitney) U—test, and for frequency analysis — the Pearson agreement criterion  $\chi^2$ . Own results it was found that of all the examined patients with any form of coronary heart disease (definite or possible) subjected to Doppler echocardiography, 75.27% had an EF of 45% or more, and 24.73% — less than 45%. The analysis of indicators in patients with coronary heart disease in general indicated that normal diastolic function was recorded in 5 (5.38%) patients, the presence of a relaxation type of LV DD in 37 (39.78%), DD Pseudonormal type LV — in 24 (25.81%), restrictive type — in 25 (26.88%). Atrial fibrillation (AF) was detected in 2 (2.15%) patients at the time of examination. Next, an analysis of the frequency of registration was carried out The DD of the PLH depends on the LV of the PLH. With PV of 45% or more, the relaxation type of LV DD occurred in 34 (48.57%) patients with coronary heart disease, the pseudonormal type in 21 (30%), the restrictive type in 9 (12,86%). Normal diastolic function was registered in 4 (5.71%) and AF in 2 (2.86%) patients. With LV of less than 45%, the frequency of registration of various types of LV DD was presented as follows: the absence of LV DD was recorded in 1 (4.35%) patient, relaxation type LV DD in 3 (13.04%) and restrictive type in 16 (69.57%) patients with coronary heart disease. LV DD is regarded as the initial stage of CHF formation, preceding systolic heart failure. It can occur in the absence of systolic dysfunction and in some cases is the cause of sudden death. The frequency of LV DD registration in the population

determines the risk of such a formidable complication as CHF, therefore, in the course of our study, we studied the frequency of registration and types of LV DD with preserved and impaired systolic function, i.e. depending on LV EF (EF 45% or more and EF less than 45%). The results showed that, that patients with coronary heart disease had the highest percentage of the relaxation type of LV DD, the pseudonormal and restrictive types occurred with approximately the same frequency. At the time of the survey, 2.15% of respondents had AF. Further, it was found that with PV of 45% or more, the relaxation type of LV DD was almost 4 times more often registered, and the restrictive type was more than 6 times more often noted with PV of less than 45%. The pseudonormal type occurred only in patients with PV 45% or more.

## CONCLUSIONS

Thus, the analysis shows that almost 1/3 of patients with coronary heart disease have restrictive (the most unfavorable in prognostic terms) the type of LV DD, which significantly prevailed in people with reduced LV. With PV of 45% or more, the advantage was for the relaxation type of LV DD, which indicates that with timely and adequate secondary prevention measures, it is possible to slow down further deterioration of LV diastolic function, and hence the transition to systolic heart failure.

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