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Usmanova Umida Iminzhanovna, Associate Professor

Nasirdinov Murodjon Adhamjon o'g'li ,

Assistant of the department FDT-1

Andijan State Medical Institute

Uzbekistan. Andijan

MECHANISMS OF LEFT VENTRICLE'S MYOCARDIUM'S REMODELING AND DEVELOPMENT OF CARDIAC INSUFFICIENCY AT THE PATIENTS WITH POST INFARCTION CARDIO SCLEROSIS.

Anotation: Structural-functional changes of left ventricle's myocardium was characterized by increase of final systolic volume to 35.4%, left ventricle's wall's thickness' ratio to 64% and of left ventricles myocardium mass index nearly in 2 time at patients with II functional class of chronic cardiac insufficiency by comparison with control group. Changes of structural functional rate of heart was accompanied by appearance of systolic disfunction with decrease of ejection fraction to 12.9% by comparison with control. Such character of myocardium's structural – functional properties' indicates about primary diastolic disfunction of left ventricle and compensatory increase of importance of atrial component for preservarion of hemodynamic stalility.

K e y w o r d s: post-infarction cardio sclerosis, left ventricle, final systolic size of the left ventricle, final diastolic size of the left ventricle

Аннотация: Структурно-функциональные изменения миокарда левого желудочка характеризовались увеличением конечного систолического объема до 35,4%, отношения толщины стенки левого желудочка до 64% и индекса массы миокарда левого желудочка почти в 2 раза у больных II функциональным классом хронической сердечной недостаточности по сравнению с контрольной группой. Изменения структурно-функционального ритма сердца сопровождались появлением систолической

дисфункции со снижением фракции выброса до 12,9% по сравнению с контролем. Такой характер структурно-функциональных свойств миокарда свидетельствует о первичной диастолической дисфункции левого желудочка и компенсаторном повышении значения предсердного компонента для сохранения гемодинамической стагнации.

Ключевые слова: постинфарктный кардиосклероз, левый желудочек, конечный систолический размер левого желудочка, конечный диастолический размер левого желудочка.

Relevance. Remodeling of the cardiovascular system, and in particular pathological myocardial remodeling, underlies the evolution of chronic heart failure (CHF), and its significance is the subject of research on the problem of CHF [1]. Remodeling and the nature of heart failure are directly related to structural and functional changes in the myocardium, cardiac and peripheral hemodynamic disorders, dilatation and hypertrophy, and neuroendocrine disorders that are initially adaptive in nature, which underlies differentiated therapeutic effects [2,3].

Purpose The study was to determine the significance of diastolic and systolic dysfunction of the left ventricular myocardium in heart failure in the early stages of its development.

Material and research methods. We examined 70 patients with postinfarction cardiosclerosis aged 40 to 69 years (mean age 53.6±3.8 years). Anterior localization of myocardial infarction (MI) was registered in 49 patients (70%), lower - in 12 (17.1%), lateral - in 9 (12.8%). In 58 patients (82.8%), MI occurred for the first time, in 12 (17.1%) - again. In 32 patients (45.7%), MI was preceded by unstable angina. Q-MI was determined in 61 patients (87%), in 9 patients (12.8%), MI without a Q wave occurred on the ECG. Left ventricular (LV) systolic dysfunction, ejection fraction (EF<45%) at inclusion in the study was detected in 51 patients (72.8%). The mean values of LV EF in all examined

were (51±14%). The functional class of CHF was determined according to the classification of the New York Heart Association (NYHA). 8 weeks after MI. CHF I functional class (FC) was determined in 42 patients (60%), II FC - in 18 (25.7%), III FC - in 10 (14.2%). Among the risk factors for coronary artery disease, 45 patients (64.2%) were diagnosed with hypertension, 23 patients (32.8%) smoked at the time of the examination, dyslipidemia was found in 64 patients (91.4%). 9 patients (12.8%) suffered from diabetes mellitus, 19 (27.1%) were obese. The control group consisted of 20 relatively healthy males. The study did not include patients with concomitant acute inflammatory infectious, oncological, autoimmune diseases. FC CHF was determined using a 6-minute walk test. Indicators of the contractile, pumping function of the heart and central hemodynamics were studied according to echocardiography, which was carried out on the "Sono Scape SSI-5000" device with a vector sensor with a frequency of 1.5-2 MHz using V, M - modal modes and color Doppler according to standard methods [5] . The following indicators were determined: end diastolic volume (EDV, cm3), end systolic volume (ESV, cm3) (L. Teicholz method), thickness of the posterior wall of the left ventricle in diastole (TZSLVD, cm), thickness of the interventricular septum in diastole (TIVPD, cm); indicators of myocardial contractility: stroke volume (SV), ejection fraction (EF, %). The magnitude of myocardial hypertrophy (GM) was determined depending on the values of the myocardial mass index (LVMI) more than 134 g/m2. Diastolic function was also assessed by the standard method. The following indicators were determined: the maximum flow rate of the late filling period (A, cm/s), the maximum early filling rate (E, cm/s), the E/A ratio - the ratio between the amplitudes of the E and A waves, the time of isovolumic relaxation (IVRT, ms) is the period from the closure of the aortic valve to the opening of the mitral valve, and DT(s) is the deceleration time of the early filling flow. Statistical processing of the obtained data was carried out on a personal computer by the methods of variational

statistics using the Microsoft Excel, Statistic software package using Student's criterion (t).

The results obtained and their discussion. The characteristics of the indicators that reflect the features of structural and functional changes in patients with CHF of the II functional class are presented in the table. The main changes related mainly to the morphofunctional parameters of the LV myocardium. Compared with the control, EDV was increased by 23% ($p<0.05$), ESV by 34.7% ($p<0.001$), and relative wall thickness index (RWTI) by 62.5% ($p<0.001$), LV IMM - almost two times ($p<0.001$). At the same time, stroke volume increased only by 7.9% ($p<0.05$) with a decrease in ejection fraction by 10.3% ($p<0.001$). The state of LV diastolic function was manifested in a decrease in the flow rate of the early filling period (E) by 14.1% ($p<0.01$), which was offset by an increase in the flow rate of the atrial filling period by 27% ($p<0.001$) and was reflected in a decrease E/A by 31.3% ($p<0.001$). Therefore, in patients with CHF I-II FC, there is, first of all, an increase in left ventricular myocardial hypertrophy due to muscle mass, as evidenced by a highly significant increase in LV BMI. These changes are also accompanied by an increase, first of all, in the ESV of the LV cavity of the heart, and then in the EDV with a decrease in the ejection fraction. An analysis of indicators characterizing the diastolic function of the heart indicates that the main mechanism for worsening ejection fraction occurs due to a decrease in the relaxation of the left ventricle (a decrease in E was noted). Compensatory increase in diastolic filling of the cavity of the left ventricle is achieved by increasing the activity of the left atrium, which confirms the increase in A (see table).

Table. Hemodynamic parameters of the myocardium of the left ventricle in patients with II FC CHF (M±m)

Indicators	Survey groups			
	control	II FC CHF	t criterion	p-value
Heart rate (bpm)	65,0±2,2	88,1±8,9	0,3	>0,05

BWW (cm3)	106,0±6,18	128,4±5,31	3,1	<0,001
CSR (cm3)	38,0±2,18	51,2±3,12	4,5	<0,001
IMM (g/m2)	93,1±2,11	185,1±4,26	25,6	<0,001
UV (cm3)	69,0±3,12	74,1±2,13	1,1	>0,05
EF (%)	67,0±0,81	60,1±0,91	6,8	<0,001

Comparative rating assessment of left ventricular myocardial dysfunction confirmed that the highest myocardial changes involved in the development of CHF in patients with I-II FC CHF is myocardial hypertrophy. The latter is confirmed by an increase in the t criterion by more than 10 times. The second place is occupied by morphological indicators in the form of dilatation of the cavities of the heart, as evidenced by an increase in the first place of the ESV, and then the EDV. This leads to the formation of diastolic dysfunction of the myocardium in the form of a decrease in the relaxation of the myocardium of the left ventricle in early diastole and an increase in the load on the left atrium. The result of these changes is the predominance of compensatory mechanisms for restructuring the activity of the heart, the combination of LV myocardial hypertrophy with the appearance of diastolic dysfunction and the maintenance of hemodynamics at the required level. At the same time, a slight decrease in the ejection fraction indicates a complete compensation of hemodynamics.

Literature

1. Belenkov Yu.N., Varakin V.A. Modern concept of post-infarction remodeling of the left ventricle // Rossiyskiy med. magazine -2003-T.10-No. 10.-S.469-471.
2. Vishnevsky V.I. Hemodynamic and neurohumoral aspects of chronic circulatory failure in patients with postinfarction cardiosclerosis // Russian Journal of Cardiology-2000.-№2 (22)-S.13-19.
3. Dadyk A.I., Bagriy A.E. Modern ideas about the pathophysiology of heart failure. Part I. Intracardiac disorders //Ukrainian Therapeutic Journal -2001-T.3-No.1.-S.69-74