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**ТИББИЁТДА ЯНГИ КУН
НОВЫЙ ДЕНЬ В МЕДИЦИНЕ
NEW DAY IN MEDICINE**

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HEMODYNAMIC INDICATORS OF LEFT VENTRICULAR DYSFUNCTION IN ARTERIAL HYPERTENSION

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✓ Resume

Increased blood pressure remains the most important problem in modern medicine. Arterial hypertension (AH) is associated with structural changes in the heart such as left ventricular hypertrophy (LVH), atherosclerotic lesions of the epicardial arteries, coronary arteries, and remodeling of small intramural arteries. In patients with left ventricular myocardial hypertrophy, suggests that the relationship with an increase in myocardial mass corresponded to changes in the orifices of the coronary arteries, which subsequently leads to impaired myocardial contractility

Keywords: ultrasound methods, latent left ventricular dysfunction, left atrium, arterial hypertension

ГЕМОДИНАМИЧЕСКИЕ ПОКАЗАТЕЛИ ДИСФУНКЦИИ ЛЕВОГО ЖЕЛУДОЧКА ПРИ АРТЕРИАЛЬНОЙ ГИПЕРТЕНЗИИ

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✓ Резюме

Повышенное артериальное давление остается важнейшей проблемой современной медицины. Артериальная гипертензия (АГ) связана со структурными изменениями сердца, такими, как гипертрофия левого желудочка, атеросклеротическое поражение коронарных артерий, ремоделирование мелких артерий. У больных с артериальной гипертензией при гипертрофии миокарда левого желудочка и увеличением массы миокарда, происходит изменения в устьях коронарных артерий, что в последующем приводит к нарушению сократительной способности миокарда

Ключевые слова: ультразвуковые методы исследования, скрытая дисфункция левого желудочка, левое предсердие, артериальная гипертензия

ARTERIYAL GIPERTENSIYADA CHAP QORCHA DISFUNKSIYASINING GEMODINAMIK KO'RSATGICHLARI

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✓ Rezyume

Yuqori qon bosimi zamonaviy tibbiyotning asosiy muammosi bo'lib qolmoqda. Arterial gipertenziya yurakdagi strukturaviy o'zgarishlar, masalan, chap qorincha gipertrofiyasi, koronar arteriyalarning aterosklerotik shikastlanishi va kichik arteriyalarning qayta tuzilishi bilan bog'liq. Chap qorincha miokard gipertrofiyasi va miyokard massasining ko'payishi bilan arterial gipertenziiyasi bo'lgan bemorlarda, koronar arteriyalarning og'izlarida o'zgarishlar ro'y beradi, bu esa keyinchalik miyokardning kontraktil qobiliyatining buzilishiga olib keladi

Kalit so'zlar: ultratovush tekshiruv usullari, latent chap qorincha disfunktsiyasi, chap atrium, arterial gipertenziya

Relevance

Arterial hypertension remains the most important problem in modern medicine. In addition to the widespread prevalence and lack of adequate control of blood pressure (BP), this disease significantly increases the risk of vascular accidents [7].

Arterial hypertension is a non-infectious pandemic among cardiovascular pathology, but it is constantly growing in most countries of the world [4, 10, 12]. With the progression of heart disease (including ischemic heart disease, arterial hypertension, cardiomyopathies, congenital and acquired defects), in many cases, there are signs of myocardial dysfunction, gradually leading to the manifestation of clinical manifestations of chronic heart failure. Blood pressure fluctuates throughout the day due to cyclical changes in rest and activity, changes in behavior (including daily activities and eating, emotional stress), changes in the environment (for example, ambient temperature, noise level, etc.), and endogenous circadian rhythms of the nervous, endocrine, endothelial systems [1,2,3]. Arterial hypertension (AH) is associated with structural changes in the heart such as left ventricular hypertrophy (LVH), atherosclerotic lesions of the epicardial arteries, and remodeling of small intramural arteries.

This, in turn, causes the development of coronary and heart failure. Currently, the presence of myocardial ischemia has been proven in hypertensive patients with left ventricular hypertrophy (LVH) and angiographically unchanged coronary arteries (CA) [11,16]. In recent years, the Doppler method has become increasingly widespread in the comprehensive assessment of the functional condition of the myocardium, the use of which expands the possibilities of detecting early left ventricular (LV) dysfunction at the stage of its development. An important role in this is played by infectious conditions caused by group A beta-hemolytic streptococci, with the subsequent development of carditis leading to inflammatory-dystrophic changes in the heart with the development of valvulitis, myocarditis, pericarditis. Conducted standard echocardiography at rest in the absence of impaired local contractility does not allow distinguishing patients with LVH with lesions of the main epicardial arteries from patients with angiographically unchanged coronary artery. According to the literature, the proximal segment of the coronary artery is visualized in 68% of cases, and its distal segment - in 94-100% of cases [13, 14, 15]. The presence of an atherosclerotic lesion in the proximal segment of the coronary artery will not raise doubts when registering a retrograde flow in the middle or distal segment of this artery, caused by occlusion of the proximal segment [17, 18].

It was found that in patients with essential hypertension without diastolic dysfunction (HD without DD) and hypertension with latent diastolic dysfunction (HD with LDD), even with unchanged parameters of the transmitral blood flow, according to the data of velocity parameters, violations of the diastolic function of the myocardium were revealed as a result of LV remodeling. In arterial hypertension (AH), remodeling develops not only in the left, but also in the right ventricle. The involvement of the right ventricle (RV) in the pathological process is based on the mechanism of equalizing the load on the interventricular septum (IVS), which depends on the elastic properties of the IVS and the mechanical characteristics of the free wall of the right and left ventricles [8]. The rate of development and progression of heart failure (HF) in patients with hypertension and, ultimately, the prognosis of the outcome of the disease, largely depend on the degree of involvement of the right parts in the remodeling of the heart, on the structural and functional changes in the pancreas. Prevention of cardiac remodeling and may be the key to breaking the vicious circle in the formation of chronic heart failure (CHF).

Diagnostics using ultrasound examination of the coronary arteries is not widespread. Meanwhile, there is evidence of the possibility of visualization of coronary arteries (most often the mouth of the common trunk of the left coronary artery - LCA) using transthoracic two-dimensional echocardiography. It was found that the use of modern equipment with a high resolution and a sensor frequency of at least 3.5 MHz, an echographic image of the LCA from the parasternal, apical or subcostal access can be obtained in most of the examined patients [5,6, 9].

However, timely diagnosis of the initial manifestations of myocardial dysfunctions makes it possible to start rational therapy on time and achieve not only a significant improvement in the condition of patients for a long period, but also to reduce the rate of readmission and cardiovascular mortality. Analyzing the literature data, we have to state with regret that the detection of the early stages of myocardial dysfunction is usually carried out of time. On the one hand, this is due to the patient's late seeking medical help, since the patient's state of health remains relatively satisfactory. In the mosaic lesion of the myocardium, there are areas without signs of mechanical activity, but with preserved basic physiological functions. Deviation from this ideal

geometry dictates the need for early application of diagnostic methods for the “dormant”, “stunned” left atrial myocardium [20].

A natural consequence of arterial hypertension (AH) is the formation of left ventricular hypertrophy (LVH), which leads to an increase in left ventricular (LV) rigidity and worsening of its diastolic relaxation, which leads to LV diastolic dysfunction [21].

In this regard, the idea arose of the possibility of using it to identify the initial manifestations of myocardial dysfunction against the background of the manifestation of cardiac diseases.

The purpose of these research ultrasound methods for assessing the indicators of IVS and posterior wall changes in the diagnosis of LV myocardial dysfunction in patients with hypertension without diastolic dysfunction and hypertension with latent diastolic dysfunction.

Materials and methods

43 patients with HD without DD and HD with LDD were examined, including 44 men and 62 women aged 30-55 years. The control group consisted of 21 practically healthy individuals - 14 men and 7 women.

All patients underwent a comprehensive study, ECG, standard echo graphic research with determination of the left ventricular mass index, as well as the relative thickness of the posterior wall of the left ventricle and interventricular septum, which allows characterizing the geometry of the ventricle (concentric or eccentric hypertrophy), peak velocities of early and late diastolic flows, When assessing the geometric structure of the LV in the B-mode, the thickness of the anterior, septal, posterior and lateral LV walls in diastole was measured from the parasternal approach along the short axis at the level of the MV valves and papillary muscles. The anteroposterior size of the papillary muscles was determined from the position of the LV short axis in the parasternal projection. In the M-mode, the thickness of the IVS and the posterior wall of the LV in diastole, EDC and CVR of the LV, anteroposterior size of the LA were measured.

The researches were carried out in a polyclinic on the SANOMED-500 ultrasound apparatus. During echocardiography along the long axis, the end diastolic (EDV) and end systolic (ESV) volumes of the left ventricle were determined, along the long axis and in the apical 2-chamber position, the systolic volumes of the left (OLP), LP size. Using pulse-wave Doppler, the degree of mitral regurgitation was specified. To assess the systolic function of the left ventricle, the ejection fraction (LVEF) was calculated. Impaired left ventricular diastolic function was diagnosed if people under the age of 50 had less than 55 cm / s. Changes in the thickness of the myocardium, as well as changes in the orifices of the coronary arteries. The data obtained were processed statistically using the Statistica 6.0 software package.

Results and discussions

The values of the thickness of the IVS and posterior wall in patients with hypertension without DD and hypertension with LDD were significantly higher than in the control group in the region of the median and basal regions, as well as signs of hypertrophy of papillary muscles. It is known that concentric LV hypertrophy (LVH) is more dangerous in the risk of developing sudden death, and eccentric - in the likelihood of developing CHF. The research obtained data where, in patients with HD without DD, in 38% of cases, an excess of the IVS thickness of more than 12 mm was determined. In 49% of the subjects, changes were observed both in the posterior and in the interventricular septum. In 21% of cases, the IVS and the posterior wall of the left ventricle remained unchanged. In patients with hypertension with LDD, the IVS thickness exceeded the norm by 12.8 mm in 42% of cases. In 51%, changes were observed in the IVS and the posterior wall of the LV. These values can be considered as additional diagnostic criteria for CHF.

The size and deformation of the LA closely depends on the state of the LV, the stiffness and extensibility of which during filling, as well as contractility during systole, affect the atrial parameters [19, 23].

On the conducted ECG researches, Sokolov's signs were found in 15% of the subjects, in 39% the terminal part of the ventricular complex changed. It turned out that the LVMM index in the examined patients ranged from 98.6 to 175.13 g / m² (the norm and up to 110 g / m² in women and 130 g / m² in men). In 38% of cases this indicator exceeded the standard values.

The maximum excess was 63%. At the same time, in 48% of cases, excess of the thickness of the apical and proximal part of the interventricular septum was found, and in 32% of cases there was hypertrophy of the posterior wall. Concentric hypertrophy was observed in 25% of cases, and in 52% of eccentric type. The relationship was determined by the increase in myocardial mass corresponded to changes in the orifices of the coronary arteries. In our study, the location of the coronary arteries was classic in 87% of cases. The thickness of the arterial walls is 1-2 mm, the walls are symmetrical, the inner contour is even, 21.6% were observed in the examined hypertension without DD with hypertrophy of the apical-proximal part of the interventricular septum. 35% of the walls in terms of density exceeded the density of the segment of the aortic

wall, the inner contour remained flat but more the mouths of the RCA and LCA are thickened, dense in places. In the examined GBs with LDD, their inner contour is uneven Fig. 1.

Table 1. Hemodynamic parameters of the left ventricle and left atrium

Indicators	1 group GB without DD	2group GB with LDD
Ages, years	29,50±6,28	38,95±7,15
Males/Females	43(21/22)	62(37/25)
Office systolic blood pressure, mm Hg	125,19±5,11	134,32±6,35
Office diastolic blood pressure, mm Hg	77,82±6,16	84,12±5,18
Duration of hypertension	2,47±1,19	2,52±1,62
MVP, mm	10,59±1,23	11,24±1,34
ZC LV, mm	10,05±1,33	11,13±1,78
DAC, mm	30,14±5,40	35,15±5,34
KDR, mm	50,21±3,34	53,43±4,29
BWD, ml	118,02±12,73	145,23±10,64
CSR, ml	32,71±15,79	63,79±17,41
LP volume (ml)	33,32±2,23	41,910±3,54*
LP dimensions (mm)	40,62±3,31	43,211±3,61*
LVEF,%	55,26±5,37	51,47±5,28
LVMM (B-mode), g	175,14±4,47	235,12±4,13**
LVMI, g / m2	98,31±9,12	128,13±7,55**

Note: * p <0.05, ** p <0.05 significance of differences between groups BP c-systolic blood pressure BP d - diastolic blood pressure IVS - interventricular septum LA - left atrium ALP - left atrial volume ZS LV - posterior wall of the left ventricle. EAD / EAD - end systolic / diastolic dimension. CSR / EDV - end systolic / diastolic volume. LVEF - left ventricular ejection fraction. LVMI - left ventricular myocardial mass index.



Fig.1: The state of the inner contour of the studied groups

Thus, changes in the thickness of the septal and lateral segments in complex echocardiography significantly expand the possibilities of early diagnosis of CHF in patients with hypertension without DD and hypertension with LDD.

Conclusion

It was found that the indicators can provide useful information about the condition of LV myocardial function in patients with hypertension without DD and HD with LDD as the most effective differentiating cases without impairment and with initial impairment of LV function.

In patients with hypertension without DD and HD with LDD, there is a frequent remodeling leading to hypertrophy of certain parts of the myocardium, and in 29% of cases, the concentric type of hypertrophy is found, which is considered the most aggressive in prognostic terms. In patients with left ventricular myocardial hypertrophy, suggests that the relationship with an increase in myocardial mass corresponded to changes in the orifices of the In conclusion, it should be noted that this method of early diagnosis of LV myocardial function can be performed using conventional intermittentwave Doppler sonography, and therefore the technique is available for widespread diagnostic practice.

LIST OF REFERENCES:

1. Ageev F.T., Ovchinnikov A.G. (2002). Diastolic dysfunction as a manifestation of heart remodeling // Heart failure. No 4.-S. 190-196.
2. Atayeva M. A., Jarylkasynova G.J., Baratova M.S. (2020). Assesment of heart rhythm disorders at left atrial stanning at early stages of left ventricular modeling // Journal of Critical Reviews JCR. — 7(4). – P. 1695-1699 doi:10.31838/jcr.07.04.277.
3. Abhayaratna W.P., Fatema K., Barnes M.E., et al. (2018) Left atrial reservoir function as a potent marker for first atrial fibrillation or flutter in persons > or =65 years of age. //Am J Cardiol -101.- C. 1626-1629.
4. Aminov Z. Z. Khakimova S. Z. Davlatov S. S. (2020). Improvement Of Treatment Protocols Of Pain Syndrome In Patients With Chronic Brucellosis. European Journal of Molecular & Clinical Medicine, 7(3), 2540-2545.
5. Baratova M.S., Atayeva M.A. (2020). The estimation of heart rhythm disturbances at the left atrial stunding on early stages of remodeling left ventricular // world medicine journal. No 1 (1) - P. 272-287.
6. Baratova M. S. (2020). Respiratory Viral Infections in the Formation of Left Atrial Standing and Its Early Diagnostics // American Journal of Medicine and Medical Sciences, 10(4): 269- 272. DOI: 10.5923/ j.ajmms.20201004.18
7. Baratova M.S., Ataeva M.A. et al. Dopplergraphy in the diagnosis of left ventricular myocardial dysfunctions after infectious conditions //Tibbiyotda yangi kun.-Tashkent, 2017. No. 4.- P.84-87.
8. Belenkov Yu.N., Mareev V.Yu. (2012) cardiovascular continuum. Heart failure. - T. 3 (1). - S. 7-11.
9. Călin, A., Roșca, M., Beladan, C. C., Enache, R., Mateescu, A. D., Ginghină , C., & Popescu, B. A. (2015). The left ventricle in aortic stenosis– imaging assessment and clinical implications. Cardiovascular ultrasound, 13(1), 22.
10. Demidova N.Yu. (2010). Studying the dynamics of LVH and LV diastolic function at the stages of treatment // Pathology of blood circulation and cardiac surgery. Novosibirsk. No. 4. P.70-74.

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