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ASSESSMENT OF HEART RHYTHM DISORDERS AT LEFT ATRIAL STANNING AT EARLY STAGES OF LEFT VENTRICULAR MODELING

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ABSTRACT

Aim of investigation: to study features of rhythm's disturbance at the stanning of the left atrium in a group of people with hypertension.

Material and methods: On the base of Cardiology dispensary there carried out retrospective survey of 73 ambulatory cards of patients between 30 and 56 years old with hypertension as well as irregular heartbeats. Survey have been continued for 3 years. For the evolution of the geometric model of the left ventricle was used classification (normal geometry of LV, concentric remodeling of LV- Finite diastolic size of LV, eccentric hypertrophy of LV, concentric hypertrophy of LV).

Results and discussion: Patients are separated into two groups: 1group- There are patients with hypertension but without irregular heartbeats. 2group- there are patients with both hypertonic disease as well as irregular heartbeats. Consequently, it was detected that majority of the first group has variation of LV by concentric type. Nevertheless, a concentric hypertrophy of LV had revealed a great part of the second group, where patients are suffered hypertension and disturbance of rhythm

Conclusions: Hypertension- induced heart damage lead to morpho-functional remodeling, in spite of that it changes electrophysiological features of cardiac cells. The important thing to detect irregular rhythm is existing heart's structural pathology which is called a stanning of LA.

KEY WORDS: irregular heartbeats, FA, hypertonic disease, remodeling of LV, stanning of LA.

INTRODUCTION

Heart changes that occur with arterial hypertension, is the cause of the development of cardiac arrhythmias of ventricular extrosystoles, tachycardia, atrial fibrillation (AF). Of particular importance for the development of tachycardia, AF belongs to structural changes in the atria such as "stunned" or stunning myocardium [3]. A natural consequence of arterial hypertension (AH) is the formation of left ventricular hypertrophy (LVH), which leads to increased rigidity of the left ventricle (LV) and worsening of its diastolic relaxation, which leads to LV diastolic dysfunction [1,2].

G.K. Moe et al. Concluded that any increase in the size of the left atrium (LP) increases the likelihood of developing various rhythm disturbances [13]. And in 1986, M.S. Kushakovsky described dilation of the left atrium as a prerequisite for the inevitability of atrial fibrillation [4,5]. It is known that atrial myocardial dystrophy with their subsequent "primary", as well as "secondary" (retrograde) expansion create a substrate for sinus rhythm disturbances (SR). However, earlier, in 1949, E. Phillip and S. Levin reported the possibility of developing paroxysms of tachycardia, atrial fibrillation (AF) in people who do not have any heart disease other than tachyarrhythmia itself.

It is known that with hypertension, remodeling of the left ventricle (LV) develops, which includes processes of hypertrophy and dilatation, changes in geometry and disturbances in its systolic and diastolic functions [6,12]. LV structural changes are accompanied by LP overload and its dilatation, which, in turn, is a factor predisposing to the development of rhythm disturbance. On the other hand, this rhythm disturbance in itself causes the dilatation of the drug [7, 8, 9]. However, recent studies show that a more accurate marker of structural remodeling of drugs is the volume index of drugs [10, 11].

In 1989, W. Manning et al. demonstrated in their studies that in most patients with a persistent form of AF after restoration of the sinus rhythm, a phenomenon of temporary mechanical LP dysfunction was observed, characterized by the authors as the phenomenon of "stunning" or "stunning" [15]. And in

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subsequent studies of other authors, the phenomenon of inhibition of the function of the LP and its abalone was confirmed [16, 14, 4].

In the mosaic myocardial lesion, 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 "sleeping", "stunned" myocardium of the left atrium.

Objective is to study the features of cardiac arrhythmias with left atrial stanning in the early stages of left ventricular remodeling in patients with hypertension

MATERIALS AND METHODS

On the basis of the regional cardiological dispensary, a retrospective study of 73 outpatient records of patients with hypertension and rhythm disturbance at the age of 30 to 56 years (average age 40.2 ± 2.7 years) was performed. The follow-up period was 6 months. Patients complained of a rapid heartbeat, periodic discomfort behind the sternum, a feeling of lack of air, destabilization of blood pressure. An ultrasound examination (ECHOCG) was performed.

A standard echocardiography study with determination of the left ventricular mass index and the relative thickness of the posterior wall of the left ventricle and interventricular septum allows characterizing the geometry of the left ventricle, diffuse thickening of the myocardial walls - due to interstitial edema, sizes of the left atrium, volume of the left atrium, peak velocity of the early and late diastole streams. When assessing the geometric structure of LV in the B-mode, the thickness of the anterior, septal, posterior and lateral walls of the LV into the diastole from the parasternal approach along the short axis at the level of the valves of the MR and papillary muscles was measured. The anteroposterior size of the papillary muscles was determined from the position of the short axis of the LV in the parasternal projection. In the M-mode, measurements were made of the thickness of the LV and the posterior LV wall in diastole, FDS and FSS LV, the anteroposterior size of the LV, in 4 projections, 2 projections.

In order to diagnose remodeling of the left ventricle (LV), myocardial mass, myocardial mass index, and relative wall thickness index were determined. To assess the geometric model of the left ventricle, classification was used (normal LV geometry, concentric remodeling of the left ventricle - CRL, concentric LV hypertrophy, eccentric LV hypertrophy).

Patients were divided into 2 groups: 1- group control group (n = 32) with hypertension without cardiac arrhythmias. The duration of hypertension was 4.894 ± 2.21 years, in the 2nd group (n = 41) with hypertension with cardiac arrhythmias - tachycardia, atrial fibrillation, ventricular extrosystoles, impaired ventricular repolarization. The duration of hypertension in this group was 5.820 ± 3.21 years. In the presented group, during the study, we identified the following variants of heart rhythm disturbance: tachycardia-10 (24%), frequent ventricular monotopic extrasystole-18 (44%), polytopic -6 (33%), atrial fibrillation-13 (32%) .

Statistical processing of the results was carried out using the statistical package “Statisticav.6.0”. The arithmetic mean (M) was calculated, the error of the mean (m). The normality of the distribution of the sample was evaluated by the Kolmogorov-Smirnov criterion. The significance of differences between the values was determined using Student's t-criterion with a normal distribution of the trait, with the distribution of a trait other than normal - using the non-parametric Mann-Whitney method. For the analysis of qualitative characteristics, the exact Fisher test and $\chi 2$ were used. The differences were considered significant at $p \leq 0.05$.

RESULTS AND DISCUSSION

The indicators of systolic (SBP) and diastolic blood pressure (DBP) in patients in the 2 groups were relatively higher, i.e. by 8.4% and 12% ($p < 0.05$), in relation to patients of the 1st group of the study.

In the present work, we revealed normal LV myocardial hypertrophy in the 1st group in 3.1%, in the 2nd group in 4.8%. Geometry changes among patients with hypertension without cardiac arrhythmias were detected in the largest number of patients with concentric myocardial remodeling - 21.9% (Fig. 1).

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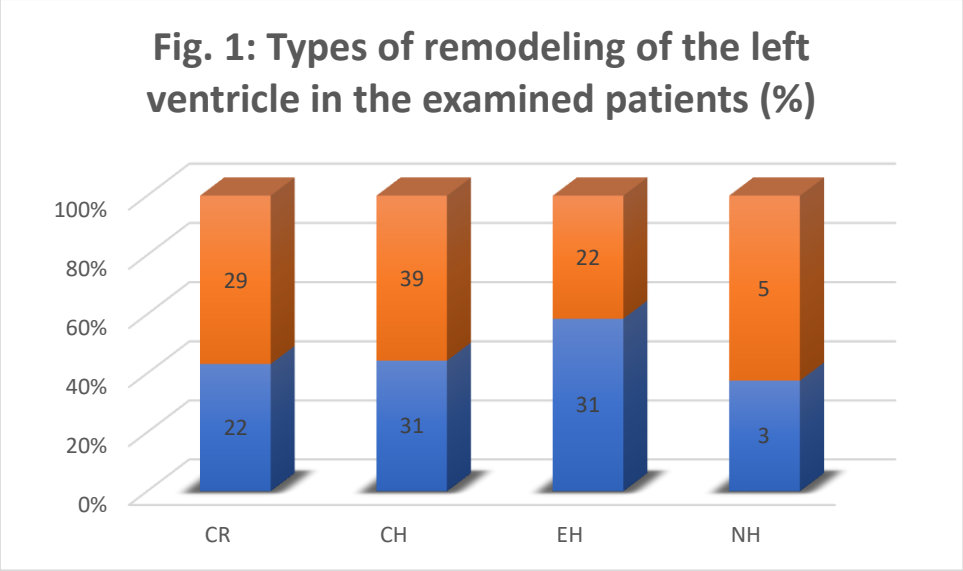

Note: CR-concentric remodeling, CH-concentric hypertrophy, EH-eccentric hypertrophy, NH-normal hypertrophy

The group of patients with hypertension and cardiac arrhythmias was dominated by individuals with concentric LV hypertrophy of 39% (n = 16), and concentric remodeling was observed in 29.3% (n = 12). Eccentric hypertrophy of 21.9% (n = 9).

In the diagnosis of left ventricular hypertrophy (LVH) in patients with arterial hypertension (AH), the main method today is considered to be echocardiography (Echocardiography). The role of electrocardiography (ECG) has recently decreased slightly.

Table 1. Hemodynamic parameters in the examined individuals

№	Study groups	1st group n=32	2nd group n=41
1	Final diastolic size, mm	53,202±3,340	54,432±4,286
2	Final systolic size, mm	32,142±4,400	36,152±5,340
3	Final diastolic volume, ml	118,020±12,730	128,126±10,643*
4	Final systolic volume, ml	31,711±16,786	36,786±18,412
5	Interventricular septum, mm	11,074±1,224	12,2400±3,033
6	posterior wall of the left ventricle, mm	10,348±2,330	12,029±2,785
7	Volume of the left atrium, ml	41,711±16,654	46,786±18,321
8	LA along the long axis	4,161±3,340	4,712±3,230
9	LVEF,%	63,256±9,372	58,468±6,282*
10	Mass of the Myocardium of the Left Ventricle (B-mode), g	213,136±6,467	285,115±5,128**
11	Left Ventricular Myocardial Mass Index (B-mode), g/m^2	98,297±9,088	168,125±7,550**
	SBP	124,210±6,210	134,424±11,400*
	DBP	83,860±6,120	94,125±8,240*

Note: * p <0.05, ** p <0.05, significance of differences between groups

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In our studies according to echocardiography, significant changes were only in the final diastolic volume, ejection fraction, left ventricular myocardial mass and left ventricular myocardial mass index. Indicators of final disatolic volume by 9%, Left ventricular myocardial mass by 34% and Left ventricular myocardial mass index by 71% were higher in the group of patients with grade 1 hypertension and cardiac arrhythmias, LV ejection fraction was 9% lower with respect to patients with grade 1 hypertension without cardiac arrhythmias.

In the study, data were obtained where, in patients with grade 1 hypertension without cardiac arrhythmias, in 35% of cases the thickness of the interventricular septum was exceeded by more than 11 mm, a slight change in the left atrium was also observed - 21%.

In 45% of the examined, changes were observed both in the posterior and interventricular septum - changes in the volume of the left atrium were moderate in 19%. In 20% of cases of the interventricular septum and the posterior wall of the left ventricle remained unchanged. In patients with grade 1 hypertension with cardiac arrhythmias in 42% of cases, the thickness of the interventricular septum exceeded the norm in 12%, where heart rhythm disturbances were often accompanied - the volume of the left atrium exceeded the norm in 38% of cases. In 49%, changes were observed along the interventricular septum and along the posterior LV wall.

When analyzing the results of daily monitoring of blood pressure in individuals with hypertension of 1 st without heart rhythm disturbance, SBP normotension was registered in 22 individuals (68.7%), stable SBP hypertension was detected in 6 patients (18.7%), and labile hypertension in 2 (6.3%) individuals labile hypotension of SBP was detected in 2 (6.3%) individuals.

According to the degree of decrease in SBP at night, the faces - “dipper” amounted to 11 (42.3%) people, “non-dippers" - 4 (15.8%) people. In terms of the degree of decrease in DBP, “dippers” made up 9 (34.6%) patients, persons with an excessive decrease in DBP (“over-dipper”) - 2 (7.6%) individuals.

In patients with hypertension of 1 st with cardiac arrhythmias of the group, normotension SBP was registered in 7 individuals (17.1%), stable hypertension of SBP was detected in 21, which was 51.2%, labile in 13 (31.7%) individuals.

In patients with hypertension of 1 st with heart rhythm disturbance of the group with a sufficient decrease in SBP during sleep (“dipper”), there were 8 (21.7%) individuals, patients with an insufficient decrease in SBP (“non-dipper”) - 2 (5, 2%), with nocturnal hypertension - 1 (2.6%) patient. According to the degree of reduction of DBP at night, the faces of “dippers” were 8 (21.7%) patients, those of “non-dippers” were 3 (7.8%) patients.

In people from the general groups, normotension of CAD was registered in 29 individuals (39.7%), stable hypertension of SBP was detected in 27, which was 37.0%, labile in 15 (20.5%) of patients, labile hypotension of SBP was detected in 2 (2.8%) of patients.

In terms of the degree of decrease in SBP, “dippers” comprised 41 (56%) patients, “non-dippers” - 28 (40%) patients, and night-pickers - 5 (5.2%) patients.

In terms of the degree of decrease in DBP, “dippers” amounted to 44 (61%) individuals, “non-dippers” and “over-dippers” –13 (18%) and 8 (21%) individuals, respectively.

CONCLUSION

Thus, the approach to assessing LV diastolic dysfunction should be comprehensive, including the study of the contractile and pumping functions of the myocardium, which in hypertension is manifested by remodeling of the left ventricle and left atrial stanning, but also by changes in the electrophysiological properties of cardiomyocytes. Ultrasound methods used to assess diastolic dysfunction of the left ventricle in patients with concentric hypertrophy and left atrial stanning can stratify the risk of developing atrial fibrillation.

Violation of the daily profile of blood pressure by type non-dipper manifests itself at the very early stages and was more common in patients of the 2nd group. An insufficient nightly decrease in blood pressure arises due to the phenomenon of increased activity of the sympathetic nervous system at night.

Hypertonic disease is a significant, potentially modifiable risk factor for cardiac arrhythmias leading to remodeling "stupidity" - stunning left atrial myocardium.

REFERENCES

1. Baratova M.S., Ataeva M.A. et al. Dopplerography in the diagnosis of left ventricular myocardial dysfunction after infectious conditions // Tibbiyotda yangi kun.- Tashkent, 2017. No. 4.-P.84-87.

2. Belenkov Yu.N., Mareev V.Yu. Cardiovascular Continuum. Heart failure. - 2002 .-- T. 3 (1). - S. 7-11.

3. Gromyko T.Yu., Saiganov S.A. Remodeling of the left atrium in patients with atrial fibrillation with various methods of restoring sinus rhythm // Bulletin of

ISSN- 2394-5125 VOL 7, ISSUE 04, 2020

the North-West State Medical University. I.I. Mechnikov. - 2017. - T. 9. - No. 2. - S. 51-59.
4. Kushakovsky, M.S. Diastolic function of the left ventricle and sizes of the left atrium in patients with paroxysms of atrial fibrillation / M.S. Kushakovsky, I.I.Yakubovich // Therapeutic Archive. - 1995. - No. 6. P. 2125
5. Kushakovsky M.S. About isolated atrial fibrillation. Bulletin of arrhythmology. –2002. - 28. - S. 9-11.
6. Miller O.N., Skurikhina O.N., Gusyatnikova T.A. et al. Angiotensin-converting enzyme inhibitors in myocardial remodeling in patients with arterial hypertension and atrial fibrillation. Russian Journal of Cardiology. - 2007.V. 5. - S. 74-78.
7. Radha B., Saiganov SA, Gromyko T.Yu. Atrial fibrillation in patients with myocardial infarction of lower localization. Bulletin of SZGMU 2015; 7 (1): 46-51.
8. Strakhova, K.V. Atrial stanning as a stage of their reverse remodeling after restoration of sinus rhythm in patients with idiopathic atrial fibrillation / K.V. Strakhova, I.V. Velikova, V.V. Mazurov // Bulletin of Arrhythmology. - 2010. - No. 62. - C: 37-40
9. Legedz L., Rial M.O., Lantelme P. Markers of cardiovascular remodeling in hypertension. Arch.Mal. Coeur. Vaiss. 2003; 96 (7-8): 729-733.
10. Aldhoon B., Melenovsky V., Peichl P., et al. New insights into mechanisms of atrial fibrillation. Physiol. Res. 2010; 59 (1): 1-12.
11.Abhayaratna W.P., Fatema K., Barnes M.E., et al. Left atrial reservoir function as a potent marker for first atrial fibrillation or flutter in persons> or = 65 years of age. Am J Cardiol 2008; 101: 1626-1629.
12. Gupta S., Matulevicius S.A., Ayers C.R., et al. Left atrial structure and function and clinical outcomesin the general population. Eur Heart J 2013; 34: 278-285.
13. Moe G.K., Rheinboldt W.C., Abildskov J.A. A. computer model of atrial fibrillation. Am. Heart J. 1964. - 67. - R. 200-20.
14. Okcun B., Yigit Z., Arat A., Baran T. et al. Stunning of the left atrium after conversion of atrial fibrillation: predictor for maintenance of sinus rhythm? // Echocardiography 2005; 22 (5): 402.
15.V. Fuster, L.E. Ryden, D.S. Cannom, et al. Recommendations of the American College of Cardiology and the American Cardiology Association and the European Society of Cardiology (2006) for the management of patients with atrial fibrillation. // Rational Pharmacotherapy in Cardiology, 2007, No. 3, P.84-111.
16. Zapolski T., Wysokinski A. Stunning of the left atrium after pharmacological cardioversion of atrial fibrillation. // Kardiol. Pol. 2005; 63: 3: 254–62.