

ASSESSMENT OF VELOEGOMETRIC INDICATORS IN YOUNG PEOPLE WITH RHYTHM DISORDERS IN ARTERIAL HYPERTENSION

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Annotation: Young patients with arterial hypertension were studied and veloegometric data were studied. It has been established that in young people, high blood pressure syndrome is detected in 62.8% of cases and differs in clinical and pathogenetic features, taking into account the changes encountered during bicycle ergometry, which requires a differentiated approach to the prevention and management of patients. In the group of people with systolic-diastolic arterial hypertension, diastolic dysfunction was detected without signs of left ventricular myocardial hypertrophy.

Keywords: arterial hypertension, cardiovascular system, young people, myocardial hypertrophy.

INTRODUCTION

Fluctuations in blood pressure during the day are associated with 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 levels, etc.), and endogenous circadian rhythms of the nervous endocrine, endothelial systems [20,21]. Epidemiological examinations are the basis of preventive measures to determine the significance of some etiological factors of diseases of the cardiovascular system at a young age.

The health of young people is an important factor in ensuring the social and economic

development of society in any state. In studies conducted abroad and in other countries, the main focus was on the study of arterial hypertension (AH) in adults. Hypertension in adolescents and young people was given undeservedly less attention. Currently, there is no doubt that the origins of hypertension in an adult patient lie in childhood and adolescence [5,6]. Over the past 40 years, the structure of cardiovascular diseases in childhood and adolescence has changed. Thus, according to population studies, in recent years, hypertension among adolescents and young people has been observed, depending on age and selected criteria, in 6.4–23% [19,22,24].

The prevalence of hypertension in boys aged 12 to 15 years is 2.5–3%. After the age of 15, the prevalence of hypertension among young men increases exponentially, by the age of 19–20 reaches 21%, and by mature adulthood - 39% [7,13,19,20]. Currently, indisputable evidence has been obtained that the incidence of hypertension has significantly increased in the age group from 20 to 29 years, it occurs in 5.9%.

However, timely diagnosis of the initial manifestations of myocardial dysfunction makes it possible to start rational therapy in time and achieve not only a significant improvement in the condition of patients for a long period but also to reduce the number of repeated hospitalizations and cardiovascular mortality. men aged 20–29 years are found in 5.9%. The onset of hypertension at a young age is of particular interest since even a slight increase in systolic blood pressure at this time increases the risk of cardiovascular diseases later in life [4,12,14]. According to R.G.Oganov [10,11,18], the increase in mortality is mainly due to losses in working age. The risk of developing hypertension in adulthood in adolescent boys with elevated blood pressure is 2.3 times higher. Young people are often little aware of the presence of their disease, and it is they who have a low degree of control over the level of blood pressure and treatment. Hypertension at a young age is detected accidentally in 70% of cases: during preventive examinations, bicycle ergometric tests, a military commission, or upon admission to educational institutions [2,3,9].

A peculiar clinical picture, changes in the daily blood pressure profile and constitutional and personal characteristics in hypertension at a young age, where vegetative disorders play an important role, and an increase in the tone of the sympathetic nervous system is considered to be the starting point of an increase in blood pressure in young patients, creates certain difficulties [1-5,7,9-14,15,16].

O.A.Kislyak et al. the peculiarity of the course of hypertension in young people was noted in the form of an unfavorable tendency of the early formation of lesions of target organs [13,17,23]. According to I.V.Leontieva, young men with hypertension have early and frequent involvement in the pathological process of such target organs as the brain, heart and peripheral vessels, which determines the development of complications and an unfavorable prognosis of the disease. In recent years, attention has been drawn to the increase in mortality among men aged 20–29 years from complications of hypertension [2,3,14,17].

An increase in blood pressure leads to the development of remodeling of the left ventricle (LV), which includes the processes of hypertrophy and expansion, changes in geometry and violations of systolic and diastolic functions. Structural changes in the LV are accompanied by the overload of the left atrium (LP) and its expansion, which, in turn, leads to deafening of the LP and is a factor predisposing to the development of paroxysmal rhythm disturbances, such as paroxysmal tachycardia (PT), supraventricular extrasystoles (NE), ventricular extrasystoles (VE), atrial fibrillation (AF). Even with unchanged parameters of the transmittal blood flow, according to the speed parameters, violations of the diastolic function of the myocardium were revealed, more pronounced with the development of LV remodeling. In arterial hypertension

(AH), remodeling develops not only in the left ventricle and atrium but also in the right ventricle. The involvement of the right ventricle (RV) in the pathological process is based on the mechanism of balancing the load on the interventricular septum (LV), which depends on the elastic properties of the LV and the mechanical characteristics of the free wall of the right and left ventricles. Daily blood pressure profile and constitutional and personal characteristics in hypertension at a young age [23,24,25].

Analyzing the literature data, it is necessary to state with regret that the identification of the early stages of the development of myocardial dysfunction is usually carried out untimely.

The purpose of the study: to identify the structure, variants of arterial hypertension, and diagnosis of paroxysmal rhythm disturbances in young people with arterial hypertension.

MATERIALS AND METHODS

380 young people were studied, and 125 young men showed an increase in blood pressure (BP) as a leading clinical syndrome (32.65%). In the age aspect, patients with hypertension were distributed as follows: 18-20 years - 49 people (39.2%); 21-23 years - 53 people (42.4%); 24-26 years - 23 people (18.4%).

In addition to the general clinical laboratory examination of patients including ECG, daily blood pressure monitoring (SMAD), EchoCG, and a physical exercise test on a bicycle ergometer.

A standard examination for risk stratification was carried out: ECGs were analyzed in 12 leads, and the following parameters were determined: the duration of the P wave, the height of the P wave, the shape, and type of the P wave, intra atrial pulse delay, rhythm disturbances - atrial and ventricular extrasystoles, the P-Q interval, the width of the Q wave, the depth of the Q wave, the height the R wave, the depth of the S wave, localization of the transition zone, the width of the QRS complex, the presence of violations of the conduction along the legs of the His bundle, the period of interval deviation (QR), signs of sinus node dysfunction, early repolarization.

A standard ECHOCG study with the determination of the mass index of the left ventricle, as well as the relative thickness of the posterior wall of the left ventricle and interventricular septum, which allows us to characterize the geometry of the ventricle, the size of the left atrium, the volume of the left atrium, peak rates of early and late diastolic flows, when assessing the geometric structure of the LV in the In-mode, the thickness of the anterior, septum, posterior and the lateral walls of the LV into the diastole from the parasternal access along the short axis at the level of the MK flaps and papillary muscles. The anteroposterior size of the papillary muscles was determined from the position of the short LV axis in the parasternal projection. In the M-mode, the thickness of the LVL and the posterior wall of the LV was measured in the diastole, CDR, and CSR of the LV, anterior-posterior LP size, in 4 projections, 2 projections.

RESULTS AND DISCUSSION

The examined persons were divided into the following groups:

1. vegetative-vascular dystonia of the hypertensive type (VSD according to GT) was detected in 59 patients (47.37%),
2. highly normal arterial hypertension (HPA) in 43 patients (34.21%),
3. Stage 1 hypertension (GB) in 23 patients (18.42%).

In group 1, paroxysmal rhythm disturbances were diagnosed in 23 patients (39.5%), in

group 2 – in 21 patients (47.76%), in 3 groups -16 patients (12.81%), risk distribution: risk 1 – 45 patients (36.0%), risk 2 - 34 patients (27.2%), risk 3 – in 42 patients (33.6%), risk 4 – in 4 patients (4.0%).

In total, changes in the analyzed ECG parameters were detected in 60 individuals, which amounted to 48.01%. The following were most often detected: displacement of the transition zone – V4-5 - 16 patients (12.8%), V2 – 18 patients (14.4%), V5 – 7 patients (6.4%), incomplete blockade of the right leg of the His bundle -19 patients (15.2%). Supraventricular extrasystoles in 22 patients (17.6%), ventricular extrasystole in 6 patients (4.8%), paroxysmal tachycardia in 17 patients (13.6%), short runs of atrial fibrillation in 7 patients (5.6%) (Fig. 1)

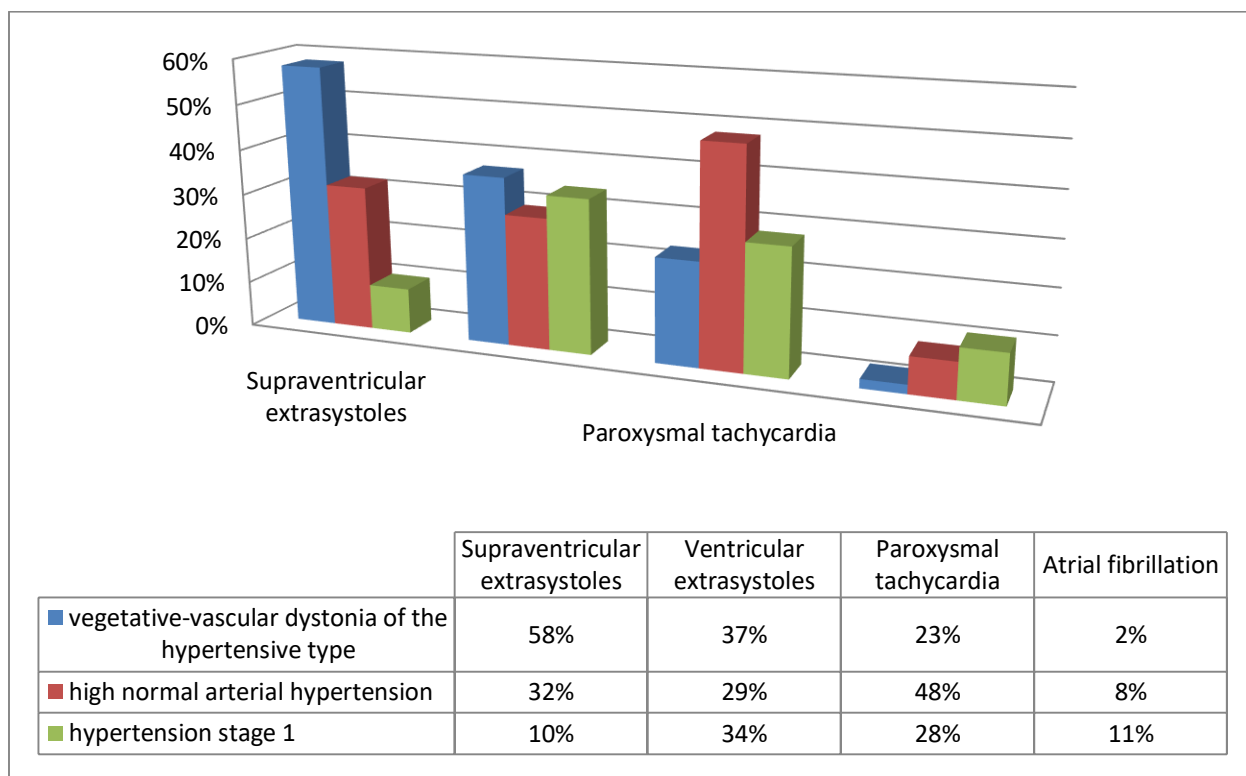


Fig.1. The diagram shows the ratio of paroxysmal rhythm disturbances for different groups of patients.

In the study, data were obtained where, in young people, in 35% of cases, an excess of thickness of the LVL of more than 11 mm was determined, and there was also a slight change in the left atrium – 21%. In 45% of the subjects, changes were observed in both the posterior and interventricular septum – the change in the volume of the left atrium was moderate in 19%. In 20% of cases, the LVP and the posterior wall of the left ventricle remained unchanged. In patients with GB 1 art. in 42% of cases, the thickness of the LVL exceeded the norm in 12%, where cardiac arrhythmias were often accompanied – the volume of the left atrium exceeded the norm in 38% of cases. In 49%, changes were observed in the LV and in the posterior wall of the LV.

When analyzing the results of SMAD, SAD normotension was registered in 85 individuals (68.0%), stable hypertension SAD was detected in 27 (21.6%), labile hypertension in 6 (4.8%) individuals, labile hypotension SAD was detected in 7 (5.6%) individuals.

According to the degree of decrease in SAD at night, "dipper" persons accounted for 53 (42.3%) people, "non-dippers" - 20 (15.8%) persons. According to the degree of reduction of

DAD, "dippers" accounted for 43 (34.4%) patients, persons with an excessive reduction of DAD ("over-dipper") – 10 (7.5%) persons.

When analyzing the results of SMAD in group 1, SAD normotension was registered in 39 individuals (66.1%), stable hypertension SAD was detected in 13 (22.0%), labile hypertension in 3 (5.0%) individuals, labile hypotension SAD was detected in 4 (6.7%) individuals.

According to the degree of decrease in SAD at night, "dipper" persons made up 26 (44.2%) people, "non-dippers" - 9 (15.2%) persons. According to the degree of reduction of DAD, "dippers" accounted for 20 (33.8%) patients, persons with an excessive reduction of DAD ("over-dipper") – 4 (6.8%) persons.

In persons of group 2, SAD normotension was registered in 27 persons (62.7%), stable hypertension SAD was detected in 11, which was 25.6%, and labile – in 5 (11.7%) persons.

In persons with a sufficient decrease in SAD during sleep ("dipper") there were 10 patients (23.2%), patients with insufficient reduction of SAD ("non-dipper") – 2 (5.2%), with nocturnal hypertension – 1 patient (2.6%). According to the degree of reduction of DBP at night, "dipper" persons accounted for 9 patients (20.9%) people, and "non-dipper" persons - for 4 patients (9.3%).

In persons of group 3, SAD normotension was registered in 9 persons (42%), stable hypertension SAD was detected in 2, which was 7.8%, labile – in 4 (13.0%) persons, labile hypotension SAD was detected in 3 (7.9%) persons.

According to the degree of decline in SAD, "dippers" accounted for 13 (56.6%) people, "non-dippers" – 8 (34.8%) persons, "night pickers" - 2 (8.6%). According to the degree of reduction of DAP, "dippers" accounted for 11 (47.8%) persons, "non-dippers" and "over-dippers" – 4 (17.4%) and 8 (34.0%) persons, respectively.

In young people, it turned out to be heterogeneous in its characteristics: 15 people (42%) could be attributed to persons with "white coat" hypertension; 12 people (30%) are persons with isolated systolic hypertension and 11 people (28%) are persons with systolic-diastolic hypertension.

To determine the tolerance to physical activity, a VEP with a stepwise increasing load was carried out. The study protocol provides 4 load stages of 3 minutes each with a power of 50 W, and 75 W, 100 W, 125 W, respectively, and a 5-minute recovery period. The test was discontinued due to the achievement of submaximal heart rate (80% or more of the maximum heart rate), extreme systolic blood pressure (SAD) (220 or more mmHg), and/ or diastolic blood pressure (DAD) (120 or more mmHg).

The control group completed the VEP due to the achievement of submaximal heart rate in 14 (63.6%) cases at the third stage, in 8 (36.4%) cases – at the fourth stage. VEP was discontinued in young people.

Group 1 in 9 (33%) cases at the second stage of the load (in 5 patients due to a decrease in submaximal heart rate, in 3 patients – reaching the maximum blood pressure, in 1 patient with simultaneous achievement of submaximal heart rate and maximum blood pressure), in 13 (52%) cases – at the third stage: (in 9 patients due to the achievement of submaximal heart rate, in 3 patients – the achievement of maximum blood pressure, in 1 patient with simultaneous achievement of submaximal heart rate and maximum blood pressure), in 5 (15%) cases – at the fourth stage of VEP when reaching submaximal heart rate.

Group 2 patients completed the test in 5 (50%) cases at the first stage due to the maximum increase in blood pressure, in 1 (12%) patients with simultaneous achievement of submaximal heart rate and maximum blood pressure), in 3 (38%) cases - at the third stage of

VEP: (in 1 patients – achievements maximum blood pressure, in 2 patients with simultaneous achievement of submaximal heart rate and maximum blood pressure).

In group 3, 2 (92%) patients stopped the test at the first stage:
(due to reaching the maximum blood pressure)

In patients with HS, the features of the dynamics of SAD during the performance of VE were revealed (Fig.2).

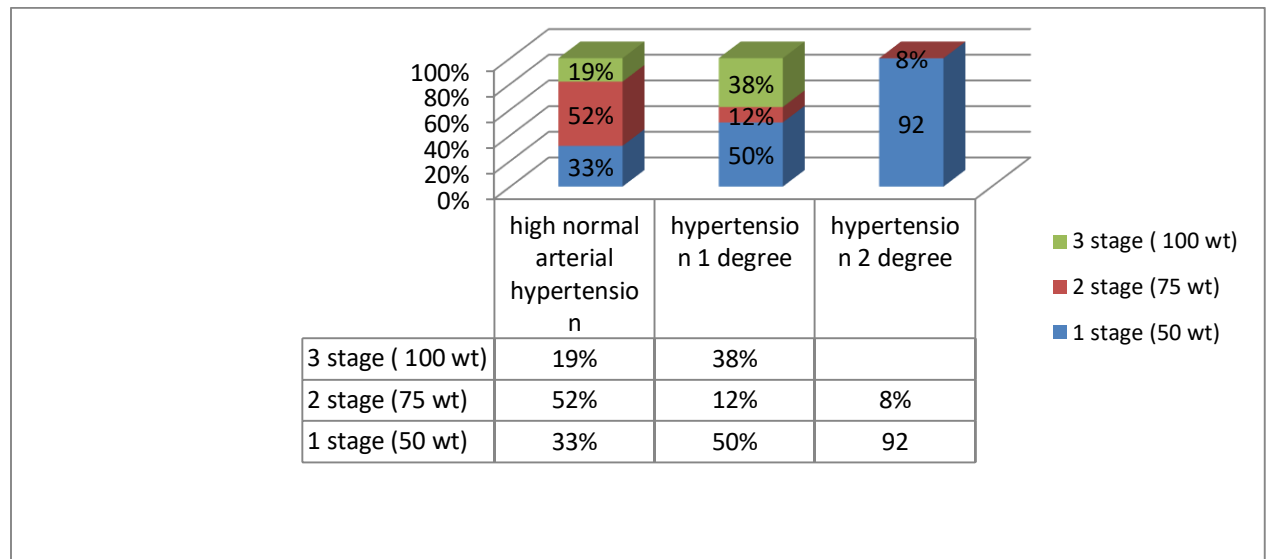


Fig.2. Performing a stress test in young patients by groups.

Young people represent the intellectual, economic, and cultural wealth of any state. National security is ensured by the most active stratum of society – young men. Detection of hypertension at the initial stages of development and differential diagnosis with a number of diseases with similar clinical symptoms is an extremely important task at the present time.

CONCLUSION

In young people with high blood pressure syndrome, GB I art. is detected in 65% of cases. GB in young people differs in clinical and pathogenetic characteristics, which requires a differentiated approach to prevention, therapy, and dispensary monitoring of these patients. Only in the group of individuals with systolic-diastolic hypertension, diastolic dysfunction was detected without signs of LV myocardial hypertrophy of the heart. In young people, initially and at all stages of the bicycle ergometric test, the level of SAD and absolute and relative indicators of SAD increase was significantly higher in patients with grade I HPA and GB than in the control group and patients with GT VSD. And in patients with VSD according to GT, compared with the control, a significantly higher level of SAD was detected initially and at 1-2 load stages

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