FEATURES OF ARTERIAL HYPERTENSION IN YOUNG PEOPLE

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The Arterial Hypertension is part of the group of cardiovascular diseases that represent the highest proportion of death causes by diseases thus highlighting the need to evaluate the risk factors that contribute to this clinical situation and its high prevalence[1]. According to official data from the World Health Organization, complications of AH cause 9.4 million deaths worldwide annually [2]. It accounts for at least 45% of deaths caused by heart disease and 51% of deaths caused by stroke [3]. AH is also the most common risk factor for peripheral arterial disease, chronic kidney disease and cognitive impairment [4]. Despite the fact that the epidemiological relationship between high blood pressure and cardiovascular disease and mortality is well known, the number of patients with AH is steadily increasing. Some studies estimate that there is a high probability of global spread of arterial hypertension, which may reach 29% of the population by 2025 [5].

All these data reinforce the importance of preventive measures aimed at preventing the development of hypertension and complications associated with it. The presence of sufficient evidence that substantiates the benefits of antihypertensive therapy [6] does not guarantee effective treatment of high blood pressure. The main problem faced by health care workers in the treatment of hypertension is the difficulty of implementing control measures. In this regard, primary prevention and early detection of risk factors remain the most effective methods in the fight against arterial hypertension [7].

Data from the National Health and Nutrition Examination Survey (NHANES, USA) 2005-2008 show that 33.5% of American adults aged 20 years and older have hypertension [10]. In Europe, this figure ranges from 30 to 45% [8]. But these data indicate the prevalence of hypertension in adults in general. However, the prevalence rates of hypertension vary greatly in different age groups. Thus, according to NHANES, in the age group from 20 to 34 years, the prevalence of hypertension in men is 11.1%, in women - 6.8%, significantly increasing at the age of 35-44 years (up to 25.1% and 19.0%, respectively). The prevalence of hypertension in men remains until the age of 55, after which the prevalence of hypertension among women becomes higher than in men [9,10]

About 80% of cardiovascular mortality occurs in low- and middle-income countries, where the greatest burden of hypertension is observed [12]. Despite the downward trend in mean systolic blood pressure among adults in Europe, Australia, and North America between 1980 and 2008, increased systolic blood pressure

continues to be observed in low- and middle-income countries. According to WHO estimates, the prevalence of hypertension is highest in Africa (46% of adults over 25 years), 35% in North and South America together, and 40% in the rest of the world, with extremely low levels of awareness and control of blood pressure [11]. Recently, much attention has been paid to the so-called high normal blood pressure. In foreign literature, this term is referred to as prehypertension . On the one hand, this blood pressure is not associated with the disease, on the other hand, according to the results of prospective studies, it can affect cardiovascular risk.

Data from the Framingham study showed that BP values between 130–139/85–89 mmHg are associated with a more than twofold increase in the relative risk of cardiovascular disease (CVD) compared with BP levels below 120/80 mmHg. [7, 8] The same trend is observed in the group of young people: the results of a longitudinal study of BP from the National Children's Blood Pressure Database (USA), which included adolescents aged 13–15 years, showed that among those who had previously been diagnosed with prehypertension , 14% of boys and 12% of girls had hypertension after 2 years. The overall rate of progression from prehypertension to hypertension was about 7% [9]. According to Kobalava Zh.D., elevated normal BP is associated with a sevenfold increase in the risk of developing cardiovascular complications compared with those with optimal BP [16]. One of the fundamental studies on the influence of prehypertension on the further development of target organ damage is a prospective The CARDIA cohort study followed 2,500 people for 25 years, all of whom were aged 18 to 30 when the study began. During this period, the participants were examined seven times. The checks included blood pressure readings. At the end of the study, they had cardiac imaging tests (using an ultrasound scan of the heart). Some people had blood pressure that was slightly higher than normal (120/80 mmHg to 139/89 mmHg) when they were under 30. This level is not high enough to be considered high blood pressure. It is known as prehypertension. But the study found that younger people with high normal blood pressure were more likely to show signs of heart disease later in life. In particular, they were more likely to develop atherosclerosis of the arteries (5.1% in women and 15.0% in men). It is very important to note that the majority of young people examined did not have clinically significant manifestations of the disease [12, 13]. The influence of risk factors and clinical and functional features of hypertension in young people.

According to the World Health Organization, human health depends on lifestyle by 50%. Currently, the influence of cardiovascular risk factors on the development of arterial hypertension in young people is widely discussed. The development of arterial hypertension in young people is influenced by many factors, such as hereditary predisposition, excess body weight, developing as a result of a sedentary lifestyle and dietary preferences, as well as physiological characteristics, manifested in an increase

in the activity of the sympathetic nervous system. The course of hypertension in young people, as well as in the older age group, is complicated by increased cholesterol levels, dyslipidemia, increased blood sugar levels and obesity [19,21,25,26,27,28]. Recently, there has been a sharp increase in the number of overweight and obese people among young people, which is a well-known risk factor for hypertension. The number of overweight young people has tripled over the past two decades [9]. The influence of such a risk factor as obesity has been described by many authors. Thus, according to V.V. According to Bekezina et al . [12], 71.4% of adolescents with metabolic syndrome (aged 11-16 years) show signs of endothelial dysfunction, and the development of vasoconstriction is recorded almost twice as often. Heredity plays a special role in the development of hypertension, including in young people. The results of several large-scale studies have clearly shown that the random distribution of blood pressure-related genetic variants (single nucleotide polymorphisms) is associated with differences in both blood pressure and cardiovascular outcome [7-10]. A study of genetically related individuals in the Framingham study showed that at different ages, BP is regulated by different sets of genes [13]. In the context of the life cycle approach, it has been proven that the influence of a genetic variant on blood pressure increases with age [12]. According to Russian researchers (Aleksandrov A.A.), genetic factors determine 38% of the phenotypic variability of SBP and 42% of DBP [2-4]. About half of young patients with hypertension indicate the presence of high blood pressure in two or more first-degree relatives. According to a number of authors, in adolescents whose close relatives suffered from hypertension, increased blood pressure is observed three times more often than in their peers with a heredity not burdened with hypertension [2, 3]. According to B.A. Namakanov , the frequency of high blood pressure among adolescents and young people with a family history of hypertension is 25-65% [4-6].

Similar data were obtained by Nechaeva G.I. during an examination of patients aged 18 to 35 years, whose parents also had elevated blood pressure. Hypertension was detected in 58.4% of those examined, elevated normal blood pressure – in 13.6% [8-10]. The impact of risk factors begins in childhood, contributing to the development of vascular changes that lead a person to the trajectory of the so-called early vascular aging, when the accumulation of still subclinical vascular damage occurs already in early adulthood [10]. In the study by Young Finns exposure to risk factors, defined as extreme quintiles of LDL cholesterol, HDL cholesterol, systolic blood pressure, body mass index (BMI), and smoking, at ages 3–18 years predicted thickening of the intima-media ratio, increased arterial pulse wave velocity, elevated blood pressure, and loss of carotid artery compliance at a 21-year follow-up at ages 24–39 years. In the same cohort, longer duration of physical activity in childhood was associated with higher carotid artery compliance later in life (15). Reducing risk factors in youth slows the progression of subclinical cardiovascular injury.

Confirmatory results were also presented in the CARDIA and AGHALS studies [12]. Lifestyle changes usually result in a rather small reduction in blood pressure, but they can act for decades, having a high potential to improve cardiovascular outcomes at the population level [10, 11]. Problems of diagnosing hypertension in young people On the one hand , diagnosing high blood pressure is not difficult and can be easily done in an outpatient setting. On the other hand, hypertension is one of the diseases that is least detected in the early stages of development, which is especially important at a young age. Although timely diagnosis of hypertension at an early stage, achieving target blood pressure values and subsequent blood pressure control can significantly reduce the risk of rapid development of target organ damage and the occurrence of cardiovascular complications. There are several reasons leading to untimely diagnosis of arterial hypertension in young people. One of them is the absence of clinical manifestations at the onset of the disease. A long asymptomatic period leads to the fact that young people do not know about their high blood pressure for a long time, rarely consult a doctor and are not inclined to self-monitor blood pressure. The results of the study by Nechaeva G.I. indicate that most young people often have no complaints when their blood pressure increases. She observed people aged 18 to 35 whose parents suffered from arterial hypertension. These young people were actively invited to the clinic for examination. As a result, it was found that in terms of the structure and frequency of complaints, patients with high normal blood pressure and stage I hypertension did not differ from healthy people. Both 13.4% of healthy people and 14.8% of patients with high normal blood pressure and 14.7% with stage I hypertension noted headache and general weakness ($p > 0.05$). The frequency of these complaints significantly increased only in patients with stage II hypertension (up to 83.3%). Complaints from the cardiovascular system in the form of pain in the heart area were noted only in patients with stage II hypertension – in 20.8%. The author especially notes the fact that none of the examined patients sought medical help on their own [30]. This once again proves that it can be quite difficult to register an increase in blood pressure and make a diagnosis in young people due to the lability of hypertension, but the absence of increased blood pressure in a single measurement does not mean that the disease is absent at all. The lability of hypertension, the peculiarities of autonomic nervous regulation in young people, and, as a consequence, the more frequent occurrence of white coat hypertension or, conversely, masked hypertension in young people do not allow us to judge with complete confidence the presence of the disease with a single blood pressure measurement. According to a number of authors, white coat hypertension occurs in 9% to 38% of cases of increased blood pressure [6, 8]. According to a meta-analysis conducted by Fagard R., "white coat" hypertension is observed in an average of 13% of individuals with arterial hypertension, its maximum prevalence is 32% [2, 4, 5]. The frequency of occurrence of such hypertension also

depends on the level of blood pressure: for example, with stage 1 hypertension, the percentage of "white coat" hypertension reaches 55%, and with stage 3 hypertension - only 10 %. "White coat" hypertension is more common in women and non-smokers [1, 3, 4]. It is very important to note that the likelihood of this phenomenon is much lower in cases where blood pressure is measured not by a doctor, but by a nurse or other health care worker, and also if blood pressure is measured outside the walls of a medical institution [12].

Should we pay attention to “white coat” hypertension, or can these patients be safely classified as normotensive ? There is no clear answer at the moment. According to the European Society of Cardiology, in individuals with an increased reaction to blood pressure measurements by a health care professional, in- office measurements also in most cases show higher numbers. These individuals are more often found to have asymptomatic left ventricular hypertrophy, and they are more likely to have metabolic risk factors (dyslipidemia, hypoglycemia) [8]. Apparently, this is due to the fact that such patients are often treated as normotensive , as a result of which they do not undergo the necessary examination. Therefore, the European guidelines for the treatment of arterial hypertension recommend a thorough examination, confirming the diagnosis of “white coat” hypertension no later than 3–6 months later and monitoring them, including repeated blood pressure measurements [8]. The opposite of this problem is the so-called masked or hidden hypertension. This condition is characterized by normal blood pressure values detected during examination in medical institutions and high blood pressure values during out-of-office measurements. The average prevalence of masked hypertension, according to Fagard R., as well as "white coat" hypertension, fluctuates around 13% (from 10 to 17%) [5, 6, 8]. However, unlike "white coat" hypertension, hidden hypertension is more common in young people. More often these are men prone to obesity. In addition, smoking and alcohol consumption contribute to increased blood pressure. Hypertension is provoked by physical and psychoemotional stress, stress at work, and a burdened family history. Masked hypertension is more often observed in people with high normal office blood pressure. Thus, most of these patients simply fall out of the doctors' field of vision and do not undergo proper examination. As a result, they are more often diagnosed with asymptomatic damage to target organs, and such patients have a much higher risk of developing persistent hypertension [33-34]. It is also very important to assess the likelihood of developing stable hypertension in young people, i.e. the so-called tracking phenomenon.

Conclusions: The relevance of Arterial Hypertension in young people is quite high, being one of the most common, but also one of the least diagnosed diseases. Non-specificity of clinical manifestations of hypertension in young people and the lack of adequate diagnostic algorithms focused on this age complicate the medical assessment

of the symptoms of the disease. Due to the high risk of developing severe complications, which often cause disability and mortality of the population, hypertension remains one of the serious health problems worldwide. An important role is early detection, prevention of risk factors, timely treatment, which will further contribute to improving the quality of human life.

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