Current Problems of Modern Cardiology: Why Is Hypertension Getting Younger?

Oybekova G.S	Andijan State Medical Institute, Andijan
Khuzhamberdiev M.A	Andijan State Medical Institute, Andijan
Vakhabov B.M.	Andijan State Medical Institute, Andijan.

ABSTRACT

The review article presents data on the prevalence of arterial hypertension in young people, pathogenetic mechanisms and peculiarities of diagnosis.

Keywords: Arterial hypertension, risk factors, young age, sympathoadrenal system

Introduction. Currently, numerous clinical studies have proven that arterial hypertension (AH) is an increase in systolic pressure above 140 and diastolic pressure above 90 mm. Hg is the most powerful, independent and preventable risk factor for death or disability from cardiovascular disease. In recent years, high blood pressure (BP) continues to remain one of the most significant risk factors for cardiovascular diseases due to many factors, including the consistently high prevalence and increasing incidence [1,3,4,6,9]. Every year, about 10 million people are killed worldwide. According to the latest WHO statistics, the prevalence of hypertension by the end of 2022 in the world was 1.3 billion people, with about 40% unaware of their disease, only 10% receiving treatment. Over the past 30 years, the prevalence of hypertension among people aged 30–79 years has doubled, but achievement of target BP levels remains very low [19]. Despite the conduct of multipurpose screening studies, the issues of early detection of the disease remain very relevant. Recently, there has been a trend toward "rejuvenation" of the disease; if until recently, arterial hypertension mainly affected middle-aged and elderly people, and it was called a disease of this age, but now the incidence of hypertension in young people is much higher has grown.

Despite the modern capabilities of early diagnosis of cardiovascular diseases in developed and rapidly developing countries, the incidence of hypertension at a young age is higher than in countries with an average standard of living. In countries where the majority of the population is young, this problem becomes global.

In Uzbekistan, where about 50% of the population is aged 18 to 44 years, issues of prevalence, development, early diagnosis and implementation of effective preventive measures for hypertension are becoming a priority area of modern cardiology [8].

Arterial hypertension is not only one of the most common, but also one of the least diagnosed diseases, which may explain the feature that makes it difficult to diagnose hypertension in the early stages, stages in young people due to the transient nature of the

increase in blood pressure. The practitioner is not always able to register transient and short-term increases, although these rare episodes of increased blood pressure can lead to sudden cardiovascular complications. One of the features of the initial stages of hypertension is a long asymptomatic period, due to which young people do not know about the presence of the disease for a long time, and therefore rarely consult a doctor and are not inclined to independently control blood pressure, even during periods of poor health.

The increasing incidence of hypertension appears to be associated with increased life expectancy and lifestyle factors, including those of a socioeconomic nature. Almost all cardiovascular complications associated with hypertension, mainly including coronary heart disease, myocardial infarction, ischemic stroke and congestive heart failure, occur in middle and old age. Although in most population studies the prevalence of hypertension increases with age, there is currently a steady trend towards an increase in the proportion of young people (from 18 to 44 years) in the structure of patients with hypertension. In recent years, the attitude of the scientific community has changed, and more attention has been paid to young people with hypertension, in part because early identification of these subjects can prevent the development of established hypertension in adulthood. In addition, unhealthy lifestyles are increasingly being adopted by children and adolescents around the world, thereby further increasing the risk of developing hypertension in young adults.

Epidemiology of arterial hypertension in young people. According to the 2016 age classification proposed by WHO, young people include people aged 18 to 44 years [1]. There is little evidence that young people experience strong pressure to cope with any changes in society, which is a major factor in many chronic diseases. According to the World Health Organization (WHO), every fourth man and every fifth woman has increased blood pressure. As a major modifiable risk factor for cardiovascular disease it accounts for approximately 45% of global cardiovascular morbidity and mortality.

The article by Mensah G. highlights that in 2015, exposure to high systolic blood pressure was responsible for 10.7 million deaths. The prevalence of hypertension is increasing (along with the ongoing obesity epidemic), and elevated BP in young adults remains the strongest predictor of hypertension in adults [10].

Over the past 25 years, global age-standardized cumulative exposure to hypertension has increased in men but not in women. A pooled analysis of 1,479 population-based measurements covering more than 19 million participants over four decades found that the number of adults with hypertension increased from 594 million in 1975 to 1.13 billion in 2015. The exact prevalence of hypertension among young people is relatively difficult to estimate because available data vary widely depending on age groups, selection criteria, techniques used to measure BP, number of BP measurements available and outpatient visits for study groups [3].

In observational studies conducted in the United States, about 19% of 14,000 participants aged 24 to 32 years included in the National Longitudinal Study of Adolescent Health had high blood pressure. However, these results were not consistent results of the National Health and Nutrition Examination Survey (NHANES), where only 4% of young people suffered from hypertension. Observed
the discrepancies between the results of the two studies were due to different characteristics of the two populations covered and different methods used to measure blood pressure levels [17].

According to other epidemiological data in the United States, approximately 40% of people aged 18 to 59 years were classified as hypertensive. The prevalence of elevated systolic blood pressure correlates with age, but younger people tend to develop diastolic hypertension, which can be underestimated from the point of view of preventing cardiovascular diseases. In any case, it is estimated that almost one in five young people suffer from elevated blood pressure [18].

In a study of 2060 Brazilian residents aged 23 to 25 years, the prevalence of persons with borderline values of blood pressure and hypertension was 13.5% and 9.5%, respectively [15].

According to Chinese researchers, in one of the provinces of China there is an increase in the incidence of hypertension from 4.4% to 14.1% in people aged 18 to 29 years, and from 7.5% to 29% in people aged 30 to 39 years [13, 20]. According to Indian studies conducted in the state of Kerala, the estimated prevalence of hypertension between the ages of 20 and 29 years ranges from 15.3% in women and 30.5% in men, and 25.8% and 37.7% in those over 30 years of age. up to 39 years [14].

The results of the studies carried out by Pires J. et al. suggest that the prevalence of hypertension in a cohort of 1464 residents of the city of Danda (Northern Angola) aged 18 to 40 years was 8.5% for women and 21.2% for men [16].

As you can see, the results of studies conducted in many countries of the world, covering all continents of the world, showed that there is a widespread increase in the incidence of hypertension, and this figure is highest in the group of young people aged 30-39 years. The authors associate the increase in the incidence of hypertension with a violation of a healthy lifestyle, a low level of health education among the population, the rapid development of the economy and infrastructure, the development of convenient transport routes and physical inactivity, the development of the Internet and the choice of a sedentary work style, excessive consumption of fatty foods, an increase in caloric intake and the development of obesity [11] .

A look at the possible pathogenetic mechanisms of the development of arterial hypertension in young people. The literature contains contradictory data on the effect of obesity on the stress reactivity of patients [2]. In a study by Garafova A, et al. (2014) showed that the presence of obesity does not change the response of blood pressure and catecholamines to a psychomental test in young people with hypertension. But some studies have found high reactivity in response to stress in obese patients [12].

There are also few studies linking the increase in the incidence of hypertension in young people with sympathetic overdrive, or sympathetic overload, which is associated with an increased heart rate (HR), leading to the development of many risk factors for cardiovascular diseases. Sympathicotonia and with it a decrease in vagal activity lie the basis of increased blood pressure in patients with hypertension. According to M.A. Khuzhamberdiev et al. (2022), hyperactivity of the sympathetic system is detected in young and middle-aged people and is absent in older people.

At In this case, long-term, even mild hypertension leads to a decrease in heart rate variability (HRV). Faster heart rate may increase pulsatile tension in the vascular system, especially at branch points, and enhance atherosclerotic lesions and possibly plaque rupture. A faster heart rate also increases the risk of cardiac ischemia by decreasing the amount of diastolic time. Sympathetic flow into the kidney activates β-adrenergic receptors, which increase renin release, which in turn increases the concentrations of angiotensin and aldosterone, which are involved in LV hypertrophy and the development of heart failure (HF) by affecting sympathetic hyperactivation.

According to N. Pikovskaya and co-authors, when discussing the mechanisms of blood pressure regulation in young people in response to a minor impact, we can talk not about the predominance of one of the parts of the autonomic part of the central nervous system, but about the characteristics of the cardiovascular system, which determine a specific variant reactions of the cardiovascular system and mechanisms of its regulation. These response options for the cardiovascular system, as well as the mechanisms of its regulation, can be considered as the ability or inability of the contractile elements of the heart or blood vessels to adequately respond to sympathetic stimulation.In individuals with low response indices, blood pressure changes either by increasing the contractile function of the

myocardium, or by increasing vascular tone, i.e., increasing the contractility of the smooth muscles of resistive vessels [7].

Conclusion: As can be seen from the literature, recently, against the backdrop of an extremely high prevalence of hypertension among the population, there has been a steady trend towards an increase in the proportion of young people in the structure of hypertension. The literature data shows a pronounced variation in the incidence of hypertension. The age of onset of hypertension, previously considered typical for middle-aged and elderly people, has decreased significantly. An increase in blood pressure is recorded in an earlier, younger age group. Hypertension is not only one of the most common, but also one of the least diagnosed diseases. A feature that complicates the diagnosis of hypertension in the early stages in young people is the transient nature of the increase in blood pressure. Another important feature of the initial stages of hypertension in young people is a long asymptomatic period, due to which young people do not know about the presence of the disease for a long time, rarely see a doctor and are not inclined to independently control blood pressure, even during periods of poor health [5]. One of the main difficulties in identifying hypertension is the non-specificity of the clinical manifestations of hypertension in young people and the lack of adequate diagnostic algorithms aimed at this age, which complicates the medical assessment of the symptoms of the disease and the timely diagnosis of hypertension. The trend towards "rejuvenation" of hypertension, its high prevalence among young people, the asymptomatic course and clinical heterogeneity of the disease determine the excess premature mortality of the population, worsening the demographic situation in the country, leading to significant economic damage. Under these conditions, the role of future studies devoted to studying the characteristics of the development and progression of hypertension in young people increases many times over. In this regard, there is a need for further comprehensive study of the circulatory regulation system, in particular the sympathoadrenal system, which is the basis for the development of hypertension, combining hemodynamic, metabolic factors, comorbidities and other factors of the cardiovascular continuum. One of the key points in solving this problem, in our opinion, is to conduct comprehensive studies specifically in groups that are most susceptible to frequent stress and loads, where the likelihood of changes in the functional state of the sympathetic-adrenal system is very high.

Literature

1. World report on aging and health. Geneva: World Health Organization; 2016. https://apps.who.int/iris/bitstream/handle.
2. Balanova Yu.A., Shalnova S.A., Deev A.D., Imaeva A.E., Kontsevaya A.V., Muromtseva G.A. and others on behalf of the participants of the ESSE-RF study. Obesity in the Russian population – prevalence and associations with risk factors for chronic noncommunicable diseases. Russian Journal of Cardiology. 2018;23(6):123–130. DOI: 10.15829/1560-4071-2018-6-123-130.15.
3. Boytsov S.A., Balanova Yu.A., Shalnova S.A., Deev A.D., Artamonova G.V., Gatagonova T.M. and others. Arterial hypertension among persons 25–64 years old: prevalence, awareness, treatment, control. Based on ESSE research materials. Cardiovascular therapy and prevention. 2014;13(4):4–14. DOI: 10.15829/1728- 8800-2014-4-4-14.
4. Efremova Yu.E., Oshchepkova E.V., Zhernakova Yu.V., Chazova I.E., Yarovaya E.B., Shalnova S.A. etc. Cardiovascular risk factors diseases in people with high normal blood pressure pressure in the Russian Federation (according to the epidemiological study ESSE-RF). Systemic hypertension. 2017;14(1):6–11.
5. Erina A.M., Rotar O.P., Orlov A.V., Solntsev V.N., Shalnova S.A., Deev A.D. and others. Prehypertension and

cardiometabolic risk factors (based on the ESSE-RF study). Arterial hypertension. 2017; 23(3):243–252. DOI: 10.18705/1607-419X-2017- 23-3-243-252.
6. Oganov R.G. Cardiovascular diseases at the beginning of the 21st century: medical, social, demographic aspects and pathways prevention. Federal directory. Healthcare Russia. 2013;13:257–264.
7. Pikovskaya N., Kulikov V., Abramtsova A. Features of blood pressure regulation in boys depending on their vegetative status.// Medicine and education in Siberia. 2012;2. 25-29.
8. Suyunov N.D., Ruziev K.R., Narzikulova K.Sh. Study of the prevalence of arterial hypertension // Pharmacoeconomics, 2019;1:75-76.
9. Chazova I.E., Zhernakova Yu.V., Oshchepkova E.V., Shalnova S.A., Yarovaya E.B., Conradi A.O. and others on behalf of the study participants. Prevalence of risk factors for the development of cardiovascular diseases in the Russian patient population arterial hypertension. Cardiology. 2014;54(10):4–12.
10. Battistoni A., Canichella F., Pignatell, G. et al. Hypertension in Young People: Epidemiology, Diagnostic Assessment and Therapeutic Approach. // High Blood Press Cardiovasc Prev. 2015;22:381–388.doi:10.1007/s40292-015-0114-3.
11. Costa S., Lima C., Nobre A. et al. Hypertension bearers with high risk/big risk of cardiovascular diseases and socioeconomic and health indicators. // Rev Assoc Med Bras (1992). 2018;64(7):601–10. doi:10.1590/1806-9282.64.07.601
12. Garafova A, Penesova A, Cizmarova E, et al. Cardiovascular and Sympathetic Responses to a Mental Stress Task in Young Patients With Hypertension and/or Obesity. Physiol. Res.2014; 63(Suppl. 4): S459-S67.
13. Liu X., Xiang Z., Shi X. et al. The Risk Factors of High Blood Pressure among Young Adults in the Tujia-Nationality Settlement of China. // BioMed Research International. 2017; ID 8315603, 6. doi:10.1155/2017/8315603.
14. Meshram II, Arlappa N., Balkrishna N. et al. Prevalence of hypertension, its correlates and awareness among adult tribal population of Kerala state, India. // J Postgrad Med. 2012;58(4):255-61. doi:10.4103/0022-3859.105444.
15. Nascimento B., Brant L., Yadgir S. et al. Trends in prevalence, mortality, and morbidity associated with high systolic blood pressure in Brazil from 1990 to 2017: estimates from the "Global Burden of Disease 2017" (GBD 2017) study. // Popul Health Meter. 2020;18(Suppl 1):17. doi:10.1186/s12963-020-00218-z.
16. Pires J., Sebastião Y., Langa A., Nery S. Hypertension in Northern Angola: prevalence, associated factors, awareness, treatment and control. // BMC Public Health. 2013;13:90. doi:10.1186/1471-2458-13-90.
17. Yano Y., Stamler J., Garside D. et al. Isolated systolic hypertension in young and middle-aged adults and 31-year-old risk for cardiovascular mortality: the Chicago Heart Association Detection Project in Industry study. // J Am Coll Cardiol. 2015 Feb 3;65(4):327-335. doi:10.1016/j.jacc.2014.10.060.
18. Zhang Y., Moran A. Trends in the Prevalence, Awareness, Treatment, and Control of Hypertension Among Young Adults in the United States, 1999 to 2014.//Hypertension.2017;70(4):736-742. doi:10.1161/HYPERTENSIONAHA.117.09801.
19. Zhou B., Bentham J., Di Cesare M. et al. World wide trends in blood pressure from 1975 to 2015: a pooled analysis of 1479 population-based measurement studies with 19·1 million participants. // Lancet. 2017;389(10064):37-55. doi:10.1016/S0140- 6736(16)31919-5
20. Zhao Y., Lu F., Sun H. et al. Trends in hypertension prevalence, awareness, treatment, and control rates in Shandong

Province of China. // J Clin Hypertens (Greenwich). 2012;14(9):637-43. doi:10.1111/j.175.