

## Hypertension Disease

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**Received:** 2024, 15, Sep  
**Accepted:** 2024, 21, Sep  
**Published:** 2024, 29, Oct

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**Annotation:** Provides information about hypertension, its classification, development mechanisms, elements non-drug treatment and methods of prevention of the disease.

**Keywords:** hypertension, character course, treatment options, laboratory diagnostics.

Hypertension (HD) – chronic a stable increase in blood pressure, in which in people not receiving antihypertensive drugs, systolic blood pressure level –  $\geq 140$  mm Hg. Art. and/or diastolic blood pressure level –  $\geq 90$  mm Hg. Art. (recommendation) guidelines of WHO and the International Society for Hygiene Pertensia 1999). Arterial hypertension (AH) is the cause of in far attack and stroke. According to WHO estimates, in the world in 2012  $>17.5$  million people died from heart attack and stroke.

### Abstract

➤ essential (primary) hypertension is distinguished; • secondary (symptomatic). Secondary (symptomatic) hypertension is a manifestation of the underlying disease (glomerulonephritis, pyelonephritis, renal tuberculosis, hydronephrosis, renal tumors, renal artery stenosis, thyrotoxicosis, pheo-chromocytoma, Itsenko-Cushing syndrome, etc.). Secondary hypertension accounts for 5-10% of hypertension cases. As a rule, treatment of secondary hypertension consists of treating the disease that led to increased blood pressure. Essential (primary) hypertension, or hypertension, develops as an independent chronic disease; it accounts for 90-95% of cases of increased blood pressure.

Normally, blood pressure is a labile value, that is, it changes depending on what a person is doing, what position he is in, the degree of physical activity, anxiety, etc. But after the end of exposure in a healthy person, blood pressure levels return to normal after some time on their own, in contrast to a patient whose blood pressure is normalized under the influence of drugs that quickly regulate blood pressure numbers.

Blood pressure is the force with which blood presses on the vessel walls and depends on three

hemodynamic parameters: the force of cardiac output, the total volume of blood circulating in the vascular bed, and the elasticity of the vessels and their tone (total peripheral resistance). The upper figure of blood pressure is determined by the force of blood ejection from the heart - systolic pressure, and the lower figure indicates the pressure at the moment of diastole - relaxation of the heart. It reflects the degree of resistance of the vessels to the blood flow. Recorded cases of hypertension in close relatives (heredity). High blood pressure is detected more often at an older age (age-related). Sex - in men, blood pressure is detected earlier than in women. Women have an increased risk of developing hypertension during menopause (it is during this period that 60% of women suffer from high blood pressure). This is due to hormonal imbalance and exacerbation of emotional and nervous reactions. Negroid race (these people get sick more often and have more severe complications of hypertension). Influence of weather conditions (weather-dependent people)..

Obese people are prone to hypertension 2-6 times more often than the general population. This is due to the fact that intraperitoneal fat is hormonally active, it helps suppress sex hormones, prevents glucose absorption by other tissues, supports inflammatory reactions, increases vasoconstriction and edema of the vascular wall. A decrease in physical activity increases the risk of developing the disease by 29-50%, compared to more trained people. Excess salty foods, fat imbalance, and alcohol abuse also contribute to increased blood pressure. Smoking is an undeniable factor that has a very negative effect on the walls of arteries and contributes to the occurrence and aggravation of arterial hypertension. A smoked cigarette can raise blood pressure by 10-30 mm Hg, it promotes spasm and supports the inflammatory process of the vessel wall. Emotional overload and chronic stress affect the vascular tone regulation systems and disrupt their adaptation to stress. Metabolic disorders: lipid metabolism - hypercholesterolemia and the resulting atherosclerosis of the arteries - always accompany hypertension; carbohydrate metabolism, and developing diabetes mellitus - affect the severity of hypertension and mortality from it.

Do not allow fat deposits to accumulate. Weight correction is the most important way to regulate blood pressure. A 10 kg weight gain increases blood pressure by 10 mm Hg. Eat wisely. Your diet should have a calorie content appropriate to your weight, be rich in foods containing potassium and magnesium and unsaturated fats, while the intake of saturated fats and simple carbohydrates should be limited. Do not eat a lot of salt. It causes arterial spasms and fluid retention in the body. It has been proven that when a person consumes > 5 g of salt per day, the risk of developing hypertension increases significantly. Try to move a lot, but do not overdo it. It is useful to do therapeutic exercise, swimming or walking, strive to take at least 10,000 steps every day. Avoid nervous tension: find a way to switch off if you often experience strong excitement or nervous shock (fitness, yoga, long walks). Avoid excessive tension associated with intellectual activity. Do not work at night, as this disrupts biological rhythms. Do not work in significant vibration and noise, they affect the central and peripheral nervous and vascular systems. Monitor your blood pressure, especially if your immediate relatives (parents, brothers and sisters) had or have arterial hypertension, in order to take timely measures. Contact a gynecologist in the premenopausal period and in the postmenopause to eliminate hormonal imbalance. Treat concomitant diseases of the kidneys and adrenal glands, atherosclerosis, diabetes, thyroid disease, obesity, chronic infections (for example, tonsillitis) in a timely manner. If you suffer from them, keep in mind that they aggravate the course of hypertension. Hypertension has target organs. These are the organs that suffer if blood pressure increases: the heart, brain, kidneys, peripheral arteries, and retina. Since an increase in blood pressure is associated primarily with spasm of small arteries, which worsens blood circulation, and these organs are supersensitive to deterioration of blood flow, the symptoms are caused by changes in them. The main subjective complaints from a patient whose blood pressure increases are: headaches, tinnitus, frequent dizziness, "flies" before the eyes. Later, when persistent changes in the arteries develop, complaints of poor sleep, deterioration in performance, memory, i.e. signs of encephalopathy, will appear. From the heart, rapid heartbeat,

shortness of breath, pain or discomfort in the left side of the chest, rhythm disturbances are detected, and then later manifestations of heart failure in the form of shortness of breath and edema are noticed.

In diagnosing hypertension, a special role is played by correctly collected anamnesis data. Information about the onset of the disease is carefully clarified, all possible risk factor options and patient complaints are studied with the main emphasis on complaints characterizing the involvement of target organs in the process. Particular importance is given to the pre-sense of heart failure, renal failure, strokes in the anamnesis, detection of diabetes mellitus, retinal angiopathy, aortic aneurysm. In addition to measuring blood pressure during the consultation, the examination also includes an assessment of physical data on target organs. This approach makes it possible to calculate the degree of risk, thanks to which a prognosis of the disease is created. The body mass index is necessarily calculated with the existing increase in weight. After the first consultation, the doctor establishes a preliminary diagnosis, if it has not been made earlier. Then an examination is necessary.

**Materials and methods.** Remember, there is no personal blood pressure norm. The pressure should not exceed the figures of 140 and 90 mm Hg. It is recommended to systematically and long-term take the prescribed drugs under the control of blood pressure and dynamic observation of a cardiologist or therapist

Instrumental examination: 1. Daily monitoring of blood pressure and 12-lead ECG. 2. Ultrasound examination of the heart (ECHO KG). It gives an idea of the state of the heart cavities and blood flow in it. 3. Ultrasound Dopplerography of the arteries of the kidneys and neck. 4. Urine analysis for albuminuria and biochemical blood parameters. 5. Thyroid-stimulating hormone and free T4. To assess the function of the thyroid gland. 6. Examination by an ophthalmologist to assess the state of the vessels of the fundus. When the diagnosis is clarified, a cardiologist or therapist (if the patient is treated by a therapist) prescribes drug therapy, having analyzed the examination data and all possible risk factors.

**Results.** It is necessary to provide treatment at the earliest stage - immediately after an episodic increase in pressure is noticed, preventing the development of the disease. In the treatment of hypertension, doctors of the Federal Scientific Center FMBA are guided by the latest recommendations of the European Society of Cardiology and the European Society of Arterial Hypertension Treatment According to the recommendations of the EAG/EOC, VNOG, JNC-VII, the maximum possible reduction in the risk of cardiovascular complications is the main goal of hypertension therapy [4, 66]. LVH has a much greater prognostic value as a risk factor than Table 1. Left ventricular myocardial mass index g/m<sup>2</sup> Authors For men For women R. Devereux et al. (1982) R. Devereux et al. (1984) I. Hammond et al. (1986) D. Savage et al. (1987) D. Levy et al. (1987) M. Koren (1991) A. Ganan et al. (1992) P. Okin et al. (1996) R. Devereux et al. co-authors (1996) >120 >134 > 125 >131 >150 >125 > 111 > 118 >116 >120 >110 >110 >100 >120 >125 >106 >104 >104 20 GrSMU Journal 2007 No. 1 LECTURES AND REVIEWS BP, smoking, hypercholesterolemia, age or gender [1]. In the case of regression of LVH to normal values of the MML index, the risk of cardiovascular complications decreases to values that are characteristic of patients with hypertension without LVH [4].

## Discussion

In order to achieve the reverse development of cardiac changes, pharmacological and non-pharmacological effects are used: 1. Lifestyle changes: limiting the consumption of table salt, increasing physical activity, reducing body weight, quitting smoking. 2. As drug therapy, angiotensin-converting enzyme (ACE) inhibitors,  $\beta$ -blockers, angiotensin II receptor blockers, calcium channel blockers, and diuretics are used. The effectiveness of antihypertensive therapy is determined not only by the ability of the drug to ensure adequate blood pressure control, but also by positive vascular and metabolic effects that provide organ protection. To ensure cardiac reparation in patients with GBS, an antihypertensive drug should have the following effects: lead

to the reverse development of cardio-myocyte hypertrophy; cause regression of fibrotic changes; improve coronary reserve [29, 60]. Antihypertensive drugs differ significantly in their ability to reduce the severity of LVH. According to a number of studies, the most effective in this regard are angiotensin II receptor blockers, calcium channel blockers, angiotensin-converting enzyme (ACE) inhibitors, and  $\beta$ -blockers. ACE inhibitors,  $\beta$ -blockers, and calcium antagonists primarily reduce the thickness of the LV walls, while diuretics primarily reduce its end-diastolic dimension [18, 27, 44, 52]. The decrease in LV mass index under the influence of ACE inhibitors is greater than with treatment with diuretics or  $\beta$ -blockers [56]. The most effective is combination therapy [4, 44], in which the effect of drugs falls on different mechanisms of LVH development. Conducting therapy in patients with hypertension taking into account the pathogenetic and morphological stages of the formation of the hypertensive heart is the path to the reverse development of remodeling processes and LVH, preventing the transition of HBS to the terminal stage

### Summary

Structural and functional changes occurring in the heart in hypertension are not so much compensatory changes as an independent cause of further progression of the disease and an independent unfavorable prognostic factor [62, 66]. Consideration of the progression of a patient with hypertension along the cardiovascular continuum [2] with an analysis of the stages of development of hypertension allows us to identify the most important mechanisms characteristic of each of them. Changes in the myocardium that form the basis of hypertension and their pathogenesis should be considered as a complex dynamic system representing the development and mutual influence of the processes of hypertrophy and remodeling, constantly rhythmically prevailing over each other and aggravating each other. LVH, so familiar and seemingly understandable to us, can be properly assessed and interpreted only in the context of cardiac remodeling and when analyzing these changes in space and time, including their reverse development.

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