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ARTERIAL HYPERTENSION: ETIOLOGY, PATHOGENESIS, CLINICAL MANIFESTATIONS AND DEVELOPMENT MECHANISMS

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Abstract: This article discusses the etiology, pathogenesis, clinical manifestations, and preventive measures of arterial hypertension. Risk factors leading to increased arterial blood pressure, including hereditary predisposition, unhealthy diet, stress, obesity, and a sedentary lifestyle, are analyzed. The article is intended to be useful for healthcare professionals, medical students, and patients suffering from arterial hypertension.

Keywords: Arterial hypertension, blood pressure, pathogenesis, clinical manifestations, diagnostics, treatment methods, preventive measures, statistical indicators

Introduction

Arterial hypertension is currently one of the most widespread and pressing problems among cardiovascular diseases and the general population. The disease often progresses asymptomatically for a long time and may lead to severe complications such as stroke, myocardial infarction, and heart failure. Arterial hypertension is defined as a persistent increase in blood pressure, where systolic blood pressure exceeds 140 mmHg and diastolic blood pressure exceeds 90 mmHg. Although treatment methods exist, the disease may remain asymptomatic in its early stages. For this reason, it is often referred to as the “silent killer.”

According to the World Health Organization, more than 1.5 billion people worldwide suffer from arterial hypertension. Its prevalence continues to rise due to population aging, sedentary lifestyle, unhealthy nutrition, obesity, and excessive salt consumption.

Literature Review

In recent years, arterial hypertension has occupied one of the leading positions among cardiovascular diseases. Numerous studies conducted by various authors have comprehensively examined the causes, pathogenesis, and clinical course of arterial hypertension.

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In the textbook Internal Diseases (2021), A. Gadayev considers arterial hypertension as an independent nosological entity and emphasizes that hereditary predisposition, excessive salt intake, stress, and obesity are the main etiological factors. The author clinically substantiates the asymptomatic course of hypertension over a long period and its manifestation through complications.

In the BKP manual authored by B. Qorakho‘jayev, I.T. Salomov, and M.N. Abdullayev, particular attention is paid to the pathogenetic mechanisms of arterial hypertension. Activation of the renin–angiotensin–aldosterone system, stimulation of the sympathetic nervous system, and reduced elasticity of the vascular wall are identified as the primary mechanisms leading to persistent blood pressure elevation.

Studies by A.Sh. Arziqulov and I.I. Alimidjonov describe clinical and pathomorphological changes in target organs such as the heart, brain, kidneys, and fundus of the eye in hypertensive disease. These works also analyze hypertensive crises and their complications, including myocardial infarction, stroke, and acute renal failure.

In the textbook Normal Physiology by J. Narkulov and A.N. Qodirov, physiological mechanisms regulating arterial blood pressure—such as baroreceptors, renal function, and the central nervous system—are discussed. Disruption of these mechanisms plays a crucial role in the development of arterial hypertension.

The book Pathological Physiology by X.Y. Karimov and B.O. Irisqulov highlights structural and functional changes in vascular walls, endothelial dysfunction, and their clinical consequences in arterial hypertension.

Thus, the literature review demonstrates that arterial hypertension is a multifactorial chronic disease with complex pathogenetic mechanisms, emphasizing the importance of early diagnosis and prevention.

Main Part

Under normal conditions, arterial blood pressure is 120/80 mmHg. Arterial hypertension is defined as blood pressure levels of 140/90 mmHg or higher and is common among the population. In Uzbekistan, the prevalence of arterial hypertension is estimated at 13–15%.

According to etiology, arterial hypertension is divided into two major groups:

1. Primary (essential) hypertension
2. Secondary (symptomatic) hypertension

Numerous pathological mechanisms contribute to the development of hypertension, including systolic and diastolic blood pressure levels, patient age, presence of diabetes mellitus, hereditary predisposition, obesity, physical activity level, and environmental factors. Among these, hereditary predisposition is considered one of the most significant risk factors. Not only the presence of hypertension in parents or relatives but also the age of onset and severity of complications within the family are important.

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Limited physical activity is a major lifestyle factor that leads to weakening of muscular, circulatory, and respiratory systems. Obesity increases the risk of arterial hypertension by 2–6 times. This condition is associated with endothelial dysfunction, resulting in narrowing and increased rigidity of blood vessels, which respond excessively to physiological stimuli.

Salt intake should not exceed 6–8 grams per day. Excessive alcohol consumption reduces the sensitivity of aortic and carotid baroreceptors, thereby impairing blood pressure regulation. Age is also a significant factor, as regulatory systems responsible for maintaining stable blood pressure gradually weaken with aging.

In arterial hypertension, target organs such as the heart, brain, kidneys, blood vessels, and the fundus of the eye undergo functional and organic changes. These changes are primarily based on alterations in blood-supplying arteries. Although hypertension often remains asymptomatic for a long time, common clinical manifestations include headaches (especially in the occipital region), dizziness, tinnitus, palpitations, blurred vision, and fatigue.

Diagnosis of arterial hypertension includes measuring blood pressure 2–3 times, electrocardiography, blood and urine tests, cholesterol, and glucose analysis.

The main causes of hypertensive crises are divided into:

1. Exogenous factors: emotional stress, physical exertion, non-adherence to antihypertensive therapy
2. Endogenous factors: hormonal changes during menopause, cardiac asthma, impaired cerebral circulation, and prostate dysfunction

Hypertensive crisis is a sudden and severe increase in blood pressure and is classified into:

1. Uncomplicated hypertensive crisis
2. Complicated hypertensive crisis

An uncomplicated hypertensive crisis usually lasts 2–3 hours, whereas a complicated crisis may persist from several hours to several days, with symptoms remaining even after blood pressure normalization.

Complications of hypertensive crisis include hypertensive encephalopathy, ischemic stroke, subarachnoid hemorrhage, cerebral edema, myocardial infarction, acute renal failure, hematuria, and others.

Treatment includes antihypertensive medications prescribed by a physician, salt restriction, weight normalization, increased physical activity, stress reduction, smoking cessation, and maintaining a healthy diet.

Results

Analysis of the reviewed literature indicates that arterial hypertension is a chronic disease observed across various age groups but is more prevalent among middle-aged and elderly

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individuals. Hereditary predisposition, unhealthy diet, obesity, sedentary lifestyle, and psycho-emotional stress are identified as major risk factors.

The findings confirm that arterial hypertension may remain asymptomatic for a long time but eventually leads to severe functional and organic changes in the heart, brain, kidneys, and blood vessels. Persistent elevation of blood pressure contributes to myocardial hypertrophy, impaired cerebral circulation, and reduced renal function.

Hypertensive crises represent one of the most dangerous conditions of the disease, and without timely medical intervention, they may result in life-threatening complications. Adherence to preventive measures, regular blood pressure monitoring, and compliance with medical recommendations significantly reduce the risk of complications.

Overall, early diagnosis, promotion of a healthy lifestyle, and comprehensive treatment play a crucial role in preventing severe outcomes of arterial hypertension.

Conclusion

Arterial hypertension is a widespread and highly dangerous disease of the cardiovascular system worldwide. Its high prevalence, asymptomatic course, and severe complications necessitate increased attention to this condition. Many patients become aware of the disease at a late stage, leading to delayed treatment and the development of serious cardiovascular complications. Preventive measures are far more effective than treatment, emphasizing the importance of early detection and lifestyle modification.

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