

**ARTERIAL HYPERTENSION: ETIOLOGY, PATHOGENESIS, CLINICAL
FEATURES, TREATMENT, AND PREVENTION**

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Abstract: Arterial hypertension (AH) is a common and chronic cardiovascular disorder characterized by persistently elevated blood pressure. It is a major risk factor for cardiovascular diseases, including stroke, myocardial infarction, and heart failure. The etiology of AH is multifactorial, involving genetic, environmental, and lifestyle factors. Understanding the mechanisms, clinical features, management strategies, and preventive measures is crucial to reduce morbidity and mortality. This review summarizes current knowledge on arterial hypertension in an accessible and comprehensive manner.

Keywords: arterial hypertension, high blood pressure, etiology, pathogenesis, clinical features, treatment, prevention

Introduction

Arterial hypertension, also known as high blood pressure, is a condition in which the pressure of blood against the walls of the arteries remains consistently elevated. It is one of the most common cardiovascular disorders worldwide and a leading cause of morbidity and mortality [1,2]. Often called the “silent killer,” hypertension may not produce noticeable symptoms in its early stages, yet it can silently damage vital organs such as the heart, kidneys, brain, and eyes over time [3].

The prevalence of hypertension is increasing globally, particularly in urban populations, due to factors such as poor diet, high salt intake, physical inactivity, obesity, stress, and smoking [4,5]. In addition, genetic predisposition can play a significant role, as people with a family history of hypertension are more likely to develop the condition [6]. Secondary hypertension, caused by underlying diseases such as kidney disorders or hormonal imbalances, accounts for a smaller percentage of cases but requires careful evaluation [7].

Hypertension is not just a numerical measurement; it is a major risk factor for other serious diseases, including heart attack, stroke, chronic kidney disease, and vision problems [8]. Early detection and proper management of high blood pressure are essential to prevent these complications. By understanding its causes, pathophysiology, clinical features, and treatment options, both healthcare providers and patients can take effective steps toward controlling hypertension and improving long-term health outcomes [9].

Etiology

Arterial hypertension can be classified as **primary (essential)** or **secondary**.

Primary hypertension represents 90–95% of cases and usually develops gradually without a single identifiable cause. It results from a combination of genetic factors and lifestyle influences such as excessive salt consumption, obesity, alcohol intake, lack of physical activity, and chronic stress [4,5].

Secondary hypertension accounts for 5–10% of cases and arises due to specific underlying conditions such as kidney disease, endocrine disorders (hyperaldosteronism, Cushing's syndrome, pheochromocytoma), or use of certain medications like corticosteroids and NSAIDs [7].

Table 1. Etiological Factors of Arterial Hypertension

Type	Etiological Factors	Approximate Frequency (%)
Primary	Genetic predisposition, high salt intake, obesity, sedentary lifestyle, stress	90–95
Secondary	Chronic kidney disease, endocrine disorders, medications	5–10

Pathogenesis

The development of arterial hypertension involves multiple mechanisms:

Activation of the renin-angiotensin-aldosterone system (RAAS): Overactivity of RAAS leads to vasoconstriction and retention of sodium and water, increasing blood pressure [7].

Sympathetic nervous system overactivity: Chronic activation increases heart rate and vascular resistance, contributing to sustained hypertension [8].

Endothelial dysfunction: Imbalance between vasodilators (nitric oxide) and vasoconstrictors (endothelin) impairs vascular tone regulation [9].

Renal sodium handling abnormalities: Genetic or acquired defects in renal sodium excretion lead to increased blood volume and pressure [10].

These mechanisms often interact, creating a cycle that perpetuates high blood pressure and

damages target organs over time.

Clinical Features

Hypertension is frequently asymptomatic, especially in its early stages. When present, symptoms may include headache, dizziness, palpitations, fatigue, and visual disturbances [11]. Persistent high blood pressure can lead to complications such as left ventricular hypertrophy, heart failure, stroke, kidney failure, and retinopathy [12].

Table 2. Clinical Features and Complications of Arterial Hypertension

Feature	Description	Potential Complications
Headache	Often occipital or frontal, worse in the morning	Hypertensive crisis
Dizziness	Lightheadedness, imbalance	Stroke or syncope
Palpitations	Awareness of heartbeat	Arrhythmias
Visual disturbances	Blurred vision, retinal hemorrhages	Retinopathy, vision loss
Fatigue	Reduced exercise tolerance	Heart failure
Asymptomatic	No early symptoms	Silent organ damage

Treatment

Effective management of hypertension combines **lifestyle modifications** and **medications**:

Lifestyle measures: These include reducing salt intake, maintaining healthy weight, regular exercise, limiting alcohol, quitting smoking, and managing stress [1,4].

Pharmacotherapy: Common classes of antihypertensive drugs are:

ACE inhibitors and ARBs – reduce RAAS activity

Calcium channel blockers – lower vascular resistance

Diuretics – promote sodium and water excretion

Beta-blockers – reduce heart rate and sympathetic activity [6,7]

Treatment is personalized based on age, comorbidities, and cardiovascular risk. Often, combination therapy is required to achieve target blood pressure.

Prevention

Prevention of arterial hypertension is a public health priority:

Primary prevention: Encouraging a healthy lifestyle, dietary adjustments, regular physical activity, and routine blood pressure monitoring in at-risk individuals [2,5].

Secondary prevention: Early detection, adherence to treatment, and monitoring for target organ damage to prevent complications [8].

Community-based programs, education campaigns, and policies to reduce salt consumption and promote active lifestyles are essential to reduce the prevalence and burden of hypertension.

Conclusion

Arterial hypertension is a complex, multifactorial condition that poses a significant risk to global health. Understanding its causes, pathophysiology, and clinical manifestations allows for effective prevention and management. Lifestyle interventions combined with appropriate pharmacological treatment remain the cornerstone of therapy. Early detection and adherence to therapy can significantly reduce morbidity and mortality associated with this “silent killer.” Continued research and public health efforts are critical to improving outcomes for individuals affected by hypertension.

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