



Review Article

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A CRITICAL REVIEW ON ESSENTIAL HYPERTENSION WITH SPECIAL REFERENCE TO LIFESTYLE AND PHARMACOLOGICAL MANAGEMENT

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ABSTRACT

Essential hypertension is one of the most common non-communicable disorders and remains a major risk factor for cardiovascular, cerebrovascular, and renal complications. It is usually multifactorial in origin, where genetic tendency, advancing age, obesity, high salt intake, sedentary lifestyle, stress, smoking, alcohol consumption, and unhealthy dietary habits play an important role. In most cases, no single identifiable cause is found, which makes long-term prevention and control highly dependent on lifestyle correction and regular medical management. Lifestyle modification is considered the first and most important step in the management of essential hypertension. Weight reduction, regular physical activity, salt restriction, balanced diet, stress control, adequate sleep, avoidance of tobacco, and moderation of alcohol intake help in reducing blood pressure and improving overall cardiovascular health. Along with lifestyle measures, pharmacological management is required in many patients to achieve proper blood pressure control and prevent target organ

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damage. Commonly used antihypertensive drugs include diuretics, calcium channel blockers, ACE inhibitors, angiotensin receptor blockers, and beta-blockers, selected according to patient condition, associated diseases, age, and risk profile. A combined approach of lifestyle correction and suitable pharmacological therapy gives better long-term results than either approach alone. This review highlights the importance of early diagnosis, patient education, regular monitoring, lifestyle discipline, and rational drug therapy in the effective management of essential hypertension.

Keywords: Essential Hypertension, Lifestyle Modification, Pharmacological Management, Blood Pressure Control, Cardiovascular Risk, Antihypertensive Drugs.

INTRODUCTION

Essential hypertension is a chronic condition characterized by persistent elevation of arterial blood pressure without any identifiable secondary cause. It is one of the most common lifestyle-related disorders seen in the present era and is often called a silent killer because many patients remain asymptomatic for a long time.¹ If not diagnosed and managed properly, it may gradually lead to serious complications such as coronary artery disease, stroke, heart failure, renal impairment, and retinal damage. Due to its silent progression and high morbidity, essential hypertension has become an important public health concern worldwide.²

The development of essential hypertension is mainly linked with multiple factors such as genetic predisposition, increasing age, excessive salt intake, obesity, sedentary lifestyle, mental stress, unhealthy dietary pattern, smoking, alcohol consumption, and lack of regular physical activity.³ Modern lifestyle has increased the burden of hypertension due to irregular food habits, reduced physical work, excessive screen time, disturbed sleep, and psychological stress. These factors disturb vascular tone, increase peripheral resistance, and contribute to sustained elevation of blood pressure over time.⁴

Management of essential hypertension requires both lifestyle modification and pharmacological intervention. Lifestyle measures such as salt restriction, weight control, regular exercise, balanced diet, stress reduction, adequate sleep, and avoidance of smoking and alcohol are the foundation of treatment.⁵ However, many patients also require antihypertensive drugs to achieve proper blood pressure control and prevent target organ

damage. Therefore, a combined approach of lifestyle correction, regular monitoring, patient education, and rational use of medicines is essential for effective long-term management of essential hypertension.⁶

AIM AND OBJECTIVES

AIM

- To critically review essential hypertension with special reference to lifestyle modification and pharmacological management.

OBJECTIVES

- To study the concept, causes, and risk factors of essential hypertension.
- To review the role of lifestyle factors in the development and control of hypertension.
- To assess the importance of diet, exercise, stress management, and sleep in blood pressure regulation.
- To review commonly used antihypertensive drugs and their role in management.
- To highlight the combined importance of lifestyle correction and pharmacological treatment in preventing complications.

MATERIAL AND METHODS

The present review study was carried out through a detailed literary analysis of available material related to essential hypertension, lifestyle factors, and pharmacological management. Relevant information was collected from modern medical textbooks, published research articles, review papers, clinical guidelines, journals, and authentic online databases. The collected data were analyzed to understand the concept, causes, risk factors, clinical importance, preventive measures, lifestyle modification, and commonly used antihypertensive drugs in essential hypertension. The study mainly focused on the role of diet, physical activity, stress control, sleep, smoking, alcohol intake, and rational drug therapy in the prevention and management of essential hypertension.

CONCEPTUAL STUDY

ESSENTIAL HYPERTENSION⁷

Essential hypertension is a chronic clinical condition in which blood pressure remains persistently elevated without any clearly identifiable secondary cause. It is also known as

primary hypertension and forms the majority of hypertension cases. In this condition, increased arterial pressure develops slowly over many years due to the combined effect of genetic, environmental, dietary, psychological, and lifestyle-related factors. WHO describes hypertension as a serious condition that increases the risk of heart, brain, kidney, and other diseases.

Definition of Essential Hypertension

Essential hypertension may be defined as sustained elevation of systemic arterial blood pressure, commonly diagnosed when systolic blood pressure and/or diastolic blood pressure remain above the accepted normal range on repeated measurements. The 2023 European Society of Hypertension guideline classifies Grade 1 hypertension from 140–159 mmHg systolic and/or 90–99 mmHg diastolic, while ACC/AHA uses a lower threshold of 130/80 mmHg for stage 1 hypertension.

NORMAL BLOOD PRESSURE RANGE

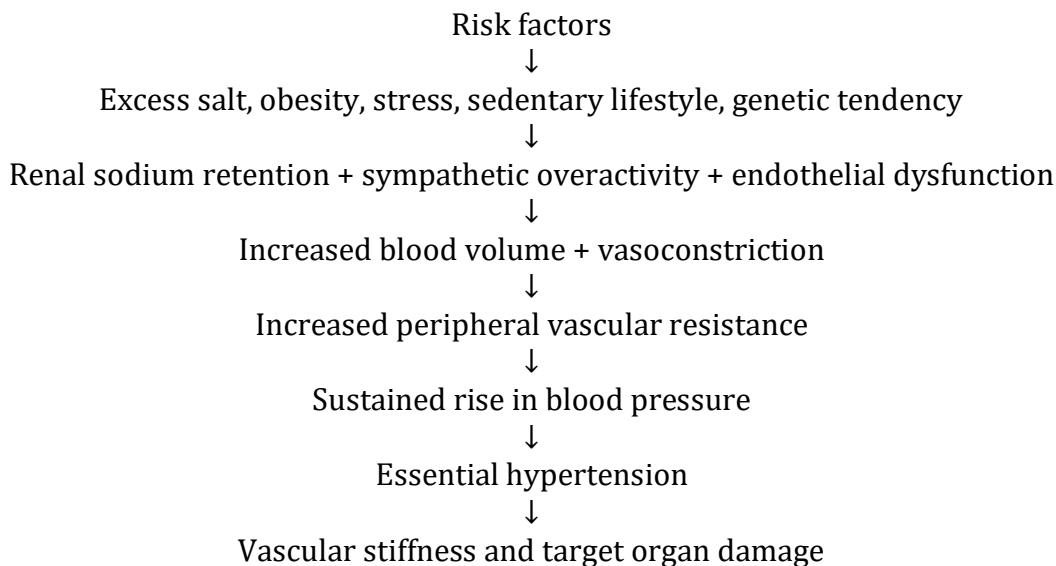
Age Group	Normal Blood Pressure Range
Children	Varies according to age, height, and sex
Adolescents	Around <120/80 mmHg
Adults 18–39 years	<120/80 mmHg
Adults 40–59 years	<120/80 mmHg
Adults ≥60 years	<120/80 mmHg, but clinical target may vary according to health status
Hypertension Stage 1	130–139 mmHg systolic or 80–89 mmHg diastolic
Hypertension Stage 2	≥140 mmHg systolic or ≥90 mmHg diastolic
Hypertensive Crisis	>180 mmHg systolic and/or >120 mmHg diastolic

Etiological Factors⁸

The exact cause of essential hypertension is not known, but it is considered multifactorial. Important modifiable risk factors include excessive salt intake, diet rich in saturated and trans fats, low intake of fruits and vegetables, obesity, physical inactivity, tobacco use, alcohol consumption, stress, and unhealthy routine. Non-modifiable factors include advancing age,

family history, genetic predisposition, and associated conditions such as diabetes mellitus and chronic kidney disease.

Pathogenesis⁹ of Essential Hypertension



Role of Lifestyle in Essential Hypertension

Lifestyle plays a major role in both development and control of essential hypertension. Sedentary habits, excessive screen time, irregular sleep, high-calorie diet, increased salt intake, smoking, alcohol consumption, and chronic mental stress directly contribute to raised blood pressure. On the other hand, regular physical activity, weight reduction, balanced diet, salt restriction, stress control, and adequate sleep help in lowering blood pressure and preventing complications. Lifestyle management is recommended as a core part of hypertension care.

Clinical Features¹⁰

Essential hypertension is often asymptomatic in the early stage, so many patients remain undiagnosed for a long period. Some patients may present with headache, dizziness, fatigue, palpitation, irritability, disturbed sleep, blurred vision, or heaviness in the head. However, symptoms are not reliable indicators of severity. Therefore, regular blood pressure measurement is necessary for early diagnosis and proper management.

Complications of Essential Hypertension

Uncontrolled essential hypertension can gradually damage vital organs. It increases the risk of coronary artery disease, myocardial infarction, stroke, heart failure, chronic kidney

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disease, retinopathy, peripheral vascular disease, and cognitive decline. WHO identifies hypertension as a major cause of premature death worldwide and highlights its serious impact on cardiovascular and renal health.

Diagnosis and Assessment¹¹

Diagnosis is mainly based on repeated blood pressure measurement using a standard and validated method. Blood pressure should not be diagnosed from a single reading unless it is severely elevated with symptoms or organ damage. Assessment also includes history taking, family history, lifestyle evaluation, physical examination, BMI calculation, and investigation of associated risk factors such as diabetes, dyslipidemia, renal disease, and cardiovascular disease.

Pharmacological Concept¹²

Pharmacological management is required when lifestyle measures alone are insufficient or when blood pressure is significantly elevated. Commonly used antihypertensive drugs include diuretics, calcium channel blockers, ACE inhibitors, angiotensin receptor blockers, and beta-blockers. Drug selection depends on age, severity of hypertension, associated diseases, cardiovascular risk, renal function, and patient tolerance. The main aim of drug therapy is to control blood pressure, reduce vascular resistance, protect target organs, and prevent long-term complications.

Diuretics

Diuretics are commonly used antihypertensive drugs that reduce blood pressure by increasing sodium and water excretion through the kidneys. This reduces blood volume and later decreases peripheral vascular resistance. Thiazide and thiazide-like diuretics such as hydrochlorothiazide, chlorthalidone, and indapamide are commonly used in essential hypertension. They are especially useful in elderly patients and salt-sensitive hypertension. Electrolyte imbalance, increased uric acid, and altered glucose levels may occur in some patients, so monitoring is necessary.

Calcium Channel Blockers

Calcium channel blockers reduce blood pressure by relaxing vascular smooth muscles and decreasing peripheral resistance. Amlodipine, nifedipine, and cilnidipine are commonly used drugs in this group. They are useful in elderly patients, isolated systolic hypertension, and

patients with angina. Common side effects include ankle edema, flushing, headache, and palpitation. Calcium channel blockers are widely used because of good efficacy and once-daily dosing.

ACE Inhibitors

Angiotensin-converting enzyme inhibitors reduce blood pressure by blocking the formation of angiotensin II, which is a strong vasoconstrictor. Drugs like enalapril, ramipril, lisinopril, and perindopril are included in this group. These drugs reduce vascular resistance and also provide renal and cardiac protection. They are useful in patients with diabetes, heart failure, and chronic kidney disease with proteinuria. Dry cough, hyperkalemia, and rise in serum creatinine may occur in some patients. They are contraindicated in pregnancy.

Angiotensin Receptor Blockers

Angiotensin receptor blockers act by blocking the action of angiotensin II at receptor level. Common drugs include losartan, telmisartan, olmesartan, valsartan, and azilsartan. These drugs are useful alternatives when ACE inhibitors cause cough. ARBs are effective in blood pressure control and also provide renal and cardiovascular protection in selected patients. Monitoring of renal function and serum potassium is important, especially in patients with kidney disease.

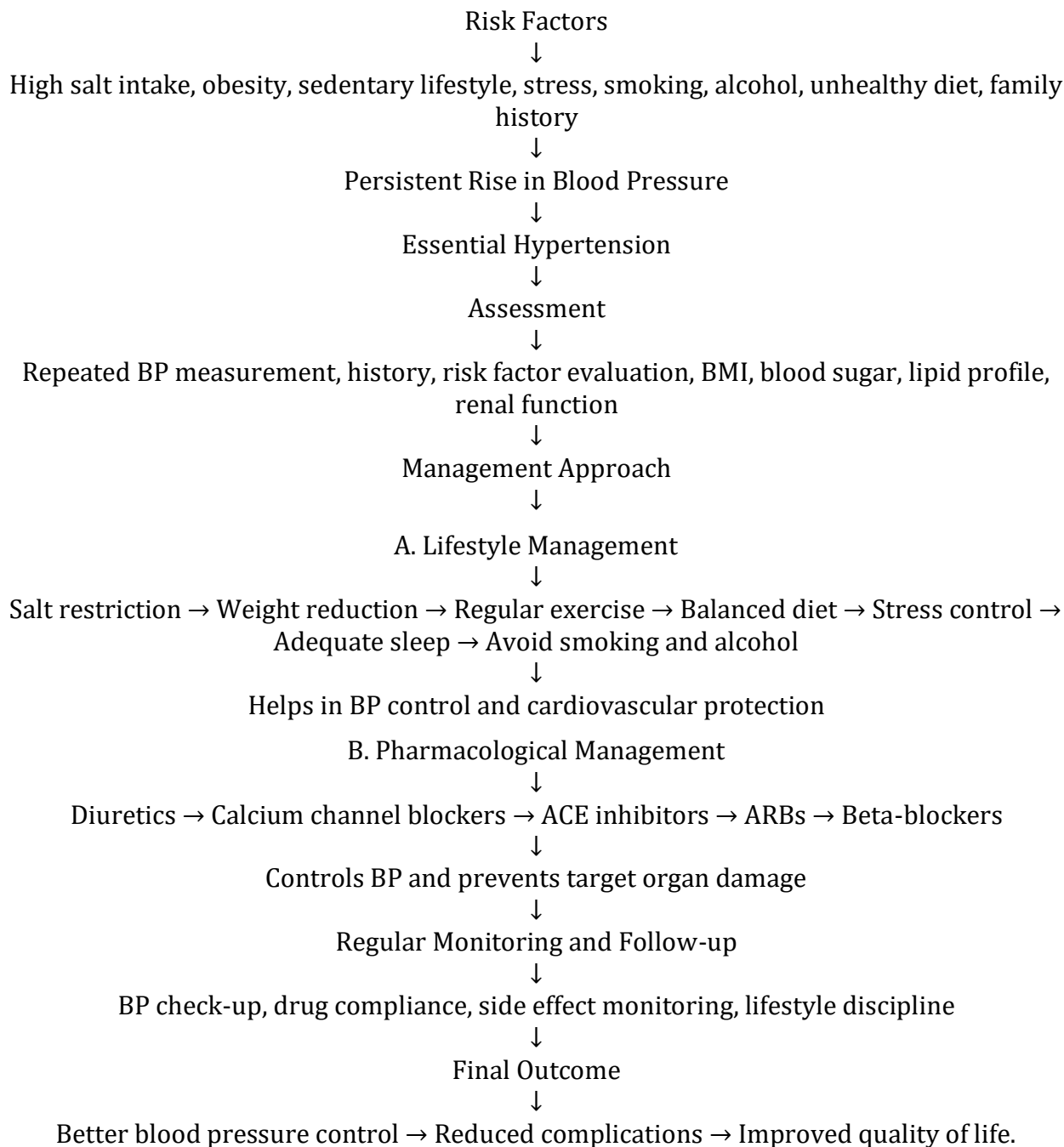
Beta-Blockers

Beta-blockers reduce heart rate, cardiac output, and sympathetic activity. Common examples include atenolol, metoprolol, bisoprolol, carvedilol, and nebivolol. They are not always preferred as first-line drugs for uncomplicated hypertension, but they are useful when there are specific indications such as ischemic heart disease, heart failure, tachyarrhythmia, post-myocardial infarction status, or increased sympathetic activity. Possible side effects include fatigue, bradycardia, cold extremities, and worsening of bronchospasm in susceptible patients.

Preventive Concept

Prevention of essential hypertension is mainly based on healthy lifestyle adoption from an early age. Salt restriction, regular exercise, maintenance of ideal body weight, consumption of fruits and vegetables, avoidance of tobacco and alcohol, stress reduction, and regular

health check-ups are important preventive measures. Early detection and continuous follow-up are very important because hypertension is often silent but progressive.



RESULT AND FINDINGS

- Essential hypertension is one of the most common lifestyle-related disorders and is strongly associated with cardiovascular, renal, and cerebrovascular complications.
- The review found that essential hypertension usually develops due to multiple factors rather than a single cause.

- Major risk factors observed in essential hypertension include high salt intake, obesity, sedentary lifestyle, mental stress, smoking, alcohol intake, unhealthy diet, disturbed sleep, and family history.
- Lifestyle modification plays a very important role in the prevention and control of essential hypertension.
- Salt restriction, regular physical exercise, weight reduction, balanced diet, adequate sleep, and stress management help in reducing blood pressure naturally.
- Dietary improvement, especially intake of fruits, vegetables, low-fat food, and reduced processed food, is beneficial in blood pressure control.
- Regular physical activity improves vascular function, reduces body weight, controls stress, and supports better cardiovascular health.
- Stress and disturbed sleep were found to be important contributing factors in the development and poor control of hypertension.
- Pharmacological treatment is necessary when lifestyle modification alone is not sufficient to maintain normal blood pressure.
- Commonly used antihypertensive drugs include diuretics, calcium channel blockers, ACE inhibitors, angiotensin receptor blockers, and beta-blockers.
- Drug selection depends on blood pressure level, age, associated diseases, renal function, cardiovascular risk, and patient tolerance.
- Combination therapy is often required in patients with uncontrolled or long-standing hypertension.
- Regular blood pressure monitoring is essential for early diagnosis, treatment adjustment, and prevention of complications.
- Patient education and treatment compliance are important for long-term control of essential hypertension.
- The review found that the best outcome is achieved when lifestyle correction and pharmacological management are used together.

- Uncontrolled hypertension may lead to complications such as stroke, myocardial infarction, heart failure, chronic kidney disease, retinopathy, and peripheral vascular disease.
- Early diagnosis, regular follow-up, and continuous lifestyle discipline can reduce morbidity and improve quality of life.
- Overall, essential hypertension requires a lifelong, individualized, and integrated management approach for effective control and prevention of target organ damage.

DISCUSSION

Essential hypertension is a chronic and multifactorial disorder in which blood pressure remains persistently elevated without any definite secondary cause. The present review shows that it is mainly associated with lifestyle-related and metabolic factors such as high salt intake, obesity, physical inactivity, mental stress, smoking, alcohol consumption, unhealthy dietary pattern, disturbed sleep, and genetic predisposition.¹³ Because the disease often remains silent in its early stage, many patients are diagnosed only during routine examination or after the development of complications. Therefore, regular blood pressure monitoring and early identification of risk factors are very important in the prevention of long-term damage.¹⁴

Lifestyle modification plays a central role in the management of essential hypertension. Salt restriction, weight reduction, regular exercise, balanced diet, stress management, adequate sleep, and avoidance of tobacco and alcohol help in reducing blood pressure and improving cardiovascular health.¹⁵ These measures are especially useful in early-stage hypertension and also improve the effect of antihypertensive medicines in patients who require drug therapy. The review also indicates that patient education is necessary because lifestyle correction requires continuous motivation, discipline, and follow-up.¹⁶

Pharmacological management is required when lifestyle measures alone are not sufficient or when the patient has moderate to severe hypertension or associated risk factors. Commonly used drug groups such as diuretics, calcium channel blockers, ACE inhibitors, angiotensin receptor blockers, and beta-blockers help in controlling blood pressure and preventing complications. Drug selection should be individualized according to age, clinical condition, comorbidities, renal function, and cardiovascular risk.¹⁷ Overall, the best management of

essential hypertension is achieved through a combined approach of lifestyle correction, rational drug therapy, regular monitoring, and long-term patient compliance.

CONCLUSION

Essential hypertension is a common chronic lifestyle-related disorder that may remain silent for a long time but can lead to serious complications like stroke, heart disease, kidney damage, and retinopathy if not controlled properly. The present review concludes that unhealthy diet, excess salt intake, obesity, physical inactivity, stress, smoking, alcohol intake, disturbed sleep, and genetic tendency are important contributing factors. Lifestyle modification is the foundation of management, while pharmacological treatment is required when blood pressure is not controlled by lifestyle measures alone or when risk is high. Regular monitoring, patient education, proper drug selection, and long-term treatment compliance are essential for effective control. Hence, a combined approach of lifestyle correction and rational antihypertensive therapy is the best way to manage essential hypertension and prevent target organ damage.

CONFLICT OF INTEREST -NIL

SOURCE OF SUPPORT -NONE

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