



CONCEPTUAL STUDY OF PREHYPERTENSION IN BOTH MODERN AND AYURVEDA POINT OF VIEW

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ABSTRACT

Prehypertension represents an intermediate state between normal blood pressure and established hypertension. It serves as an early warning sign of impending cardiovascular risk. Prehypertension is defined as systolic blood pressure of 120–139 mmHg and/or diastolic blood pressure of 80–89 mmHg and represents an early stage in the development of hypertension. Although not directly described in Ayurvedic classics, prehypertension can be conceptually understood through conditions such as Raktagata Vata, Vyana Vata vaishmya, and Rakta-dushti with involvement of Pitta and Kapha. Ayurvedic etiological factors including improper diet, sedentary lifestyle, and mental stress correspond closely with modern risk factors. The pathogenesis involves disturbance of Dosha balance and impaired circulatory regulation. Modern medicine emphasizes lifestyle modification in the management of prehypertension, which aligns well with Ayurvedic principles of Pathya-ahara, Dinacharya, Yoga, and preventive care. Thus, Ayurveda provides a holistic framework for early intervention to prevent progression to hypertension. This conceptual study aims to explore the definition, epidemiology, etiological factors, pathophysiology, clinical implications, and preventive strategies related to prehypertension, emphasizing its importance in public health and preventive medicine.

INTRODUCTION

Blood pressure (BP) is a vital physiological parameter that reflects the force exerted by circulating blood upon the walls of arteries. Maintaining optimal BP is crucial for cardiovascular health. The term prehypertension was first introduced by the Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (JNC 7) in 2003, to identify individuals at risk of developing hypertension. Prehypertension is defined as a systolic BP between 120–139 mmHg and/or a diastolic BP between 80–89 mmHg. This range is not yet pathological but indicates a tendency toward developing sustained hypertension if corrective measures are not taken.

Definition

According to JNC 7 (2003):

- Normal BP: <120/80 mmHg
- Prehypertension: 120–139/80–89 mmHg
- Hypertension: ≥140/90 mmHg

According to the American College of Cardiology (ACC)/American Heart Association (AHA) 2017:

The term 'prehypertension' has been replaced by 'elevated BP', defined as systolic 120–129 mmHg and diastolic >80 mmHg, reflecting growing evidence of risk even at lower levels.

Epidemiology

Prehypertension affects a significant proportion of adults worldwide. Global prevalence: approximately 30–50% of adults.

In India, studies show a prevalence of 33–40%, particularly among urban populations. It is more common in males, younger adults, and individuals with sedentary lifestyles or unhealthy dietary patterns. Prehypertension often precedes hypertension by 5–10 years, making early detection crucial for prevention.

Etiological Factors

Prehypertension arises from a complex interplay of genetic, environmental, and lifestyle factors, including:

1. Genetic predisposition – family history of hypertension.
2. Obesity and overweight – increased peripheral resistance and sympathetic activity.
3. High salt intake – sodium retention leading to fluid overload.
4. Stress and mental tension – sympathetic overactivity.
5. Physical inactivity – reduced vascular elasticity.
6. Alcohol and tobacco use – endothelial dysfunction.
7. Dietary patterns – low potassium, calcium, and magnesium intake.
8. Age and gender – risk increases with age and is higher in men.
9. Metabolic syndrome – insulin resistance and dyslipidemia contribute to elevated BP.

Pathophysiology

Prehypertension involves early vascular and metabolic changes that precede over hypertension:

- Endothelial dysfunction – impairs vasodilation.
- Increased sympathetic activity – raises cardiac output and vascular tone.



- Altered renin-angiotensin-aldosterone system (RAAS) – promotes vasoconstriction and sodium retention.
- Arterial stiffness – loss of elasticity leads to higher systolic pressure.
- Inflammation and oxidative stress – damage vascular endothelium.

Clinical Significance

Prehypertension is not benign. It is associated with:

- 2–3 times higher risk of developing hypertension.
- Increased incidence of ischemic heart disease, stroke, and chronic kidney disease.
- Early signs of left ventricular hypertrophy and arterial damage.
- Possible coexistence with metabolic abnormalities such as insulin resistance and dyslipidemia.

Prevention and Management

Since prehypertension is a modifiable condition, lifestyle modification remains the cornerstone of management.

1. Non-pharmacological Measures

- Dietary modification: Reduce salt (<5 g/day), increase fruits, vegetables, and whole grains; adopt DASH diet.
- Weight reduction: Maintain BMI <25 kg/m².
- Physical activity: At least 30 minutes of moderate exercise daily.
- Limit alcohol and avoid smoking.
- Stress management: Yoga, meditation, and relaxation techniques.
- Regular BP monitoring for early detection of progression.

2. Pharmacological Intervention

Generally not recommended unless there are comorbid conditions (diabetes, kidney disease, CAD), or lifestyle changes fail to control BP progression.

Ayurvedic Perspective

From an Ayurvedic standpoint, prehypertension may correspond to an early imbalance in Vata and Pitta doshas, leading to Rakta dushti (vitiation of blood) and Dhamani pratichaya (arterial thickening). Preventive approaches include:

- Ahara (diet): light, less salty, non-spicy foods.
- Vihara (lifestyle): regular exercise, adequate sleep, and mental calmness.
- Aushadhi (herbal support): Arjuna, Sarpagandha, Punarnava, puskaramoola, sati vacha etc. may help maintain cardiac balance under supervision.

CONCLUSION

Prehypertension is a crucial stage in the continuum of blood pressure disorders, acting as a window of opportunity for preventive healthcare. Through early screening, public awareness, and lifestyle intervention, its progression to hypertension can be significantly reduced. Integrating modern and traditional preventive strategies can help achieve optimal

cardiovascular health and reduce the burden of hypertension-related diseases.

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