ORIGINAL RESEARCH ARTICLE

INTERNATIONAL JOURNAL OF ANATOMY PHYSIOLOGY AND BIOCHEMISTRY

http://www.eternalpublication.com

IJAPB: Volume: 2; Issue: 5; May 2015 *ISSN(Online):2394-3440*

What is Prehypertension?

Published online on 20th May 2015©www.eternalpublication.com

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Received: 18th April 2015; Accepted: 30th April 2015

How to cite this article: Raut SE, Pagar AB. What is prehypertension?. International Journal of Anatomy Physiology and Biochemistry. 2015; 2(5):1-4.

Abstract:

Prehypertension is not a disease. But, over a period of time it progresses to hypertension. This can be managed by non-pharmacological interventions like weight reduction, dietary changes & physical activity. Its awareness can help reduce the burden of CVD in society.

Key words: Prehypertension, Hypertension, CVD, Non pharmacological interventions.

Introduction:

Blood pressure increases with age is a well-known fact, so is progression of prehypertension into hypertension. It can be prevented with proper interventions (diet and lifestyle modifications).[1-4] In India the mortality rates from cardiovascular disease (CVD) have increased from 21% in 1994 to 25% in 1998 and further to 29.1% in 2005.[5-7] Prevalence and awareness of consequences of prehypertension in Indian population are less known. In developing country like India, this information can be very useful, as with proper interventions it can help reduce the burden of CVD.

History:

In 1939 Robinson and Brucer found that normal blood pressure in higher range gradually increases over time and develops into hypertension, while studying follow up records taken for life insurance purposes. They defined this blood pressure in the range of 120-139/80-89 mmHg as prehypertension.[8]

In 2003, the seventh report of the Joint National Committee (JNC 7) similarly defined prehypertension. (Table 1)

Table 1: Classification of Blood Pressure

JNC 6 Category	SBP/DBP	JNC 7 Category
Optimal	<120/80	→ Normal
Normal	120–129/80–84	→ Prehypertension
Borderline	130–139/85–89	
Hypertension	≥140/90	→ Hypertension
Stage 1	140–159/90–99	→ Stage 1
Stage 2	160–179/100–109	→ Stage 2
Stage 3	≥180/110	

DBP, diastolic blood pressure; JNC, Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure; SBP, systolic blood pressure

Sources: The Sixth Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure. Arch Intern Med 1997;157:2413–46.

The Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure. JAMA 2003;289:2560–71.

But in 2007, The European Society of Hypertension and the European Society of Cardiology (ESH_ESC) decided not to use the term 'Prehypertension'. Instead they categorized prehypertension into 'Normal blood pressure' (120-129/80-84 mmHg) and 'High normal blood pressure' (130-139/85-89 mmHg).[9]

Despite the fact that International Hypertension Guidelines (IHG) does not recommend the use of the term prehypertension for fear of creating anxiety in a large subset of the population, the terminology was adopted to strengthen the scientific research and to bring the attention of doctors and general public to prehypertension for better hypertension prevention.[10]

Definition:

Blood pressure in the range of 120-139/80-89 mmHg is defined as prehypertension according to the Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation and treatment of High Blood Pressure.

Epidemiology:

According to National Health and Nutrition Examination Survey (NHANES III) in 2000 prevalence of prehypertension among adults in the United States was approximately 31% (men 39% and female 23%).[10] The National Nutrition Monitoring Bureau conducted a survey in nine states of India andreported the estimate of prehypertension in rural men to be about 45%.[11]

A study conducted by Dr Mohan et al in Chennai have also reported the prevalence of prehypertension in the range of 40-60%.[10]

A cross sectional study conducted by S Srinivas et al in Rural Andhra Pradesh reported the prevalence of prehypertension of 30.15%.[8]

Among rural population of Davanagere, the prevalence of prehypertension is found to be 42.9% in men and 34.2% in women.[12]

Rapid urbanization, lifestyle changes, dietary changes and increased life expectancy are the different factors that may contribute to this rising trend of prehypertension.

Pathophysiology:

With time, prehypertension progresses to hypertension. So, the same factors are involved in its development.

Increased weight is the primary risk factor for prehypertension. The other being, age, family history of hypertension, sedentary lifestyle, high sodium intake, smoking and excessive alcohol intake.[13-14]

The laboratory risk factors include increased concentrations of C reactive protein (CRP), Tumor necrosis factor alfa (TNF α), homocysteine, LDL, gamma-glutamyltransferase, microalbuminuria and other inflammatory markers. Studies also showed that individuals with prehypertension have smaller arteriolar and venular diameters and smaller arteriolar – venular ratios than normotensive individuals.[10]

Clinical presentation:

No specific symptoms are present in prehypertension. Although some studies have reported the symptoms like headache, blurred

vision, fatigue or dizziness, these are nonspecific and can be due to other reasons.[13,14]

Thus, prehypertension can go undiagnosed for a long time. The only way to detect prehypertension is to frequently check blood pressure especially in those having risk factors.

Management

Different strategies to manage prehypertension aim at, lowering the blood pressure to normal level, prevention of rise of blood pressure withage, monitoring any signs of end organ damage & cardiovascular disease.

Non pharmacological treatment

This is the main line of treatment. Plenty of evidence has proven the benefits of treating the prehypertension with lifestyle modifications like weight loss, dietary changes, physical activity, reduced salt intake, moderation of alcohol intake etc (Table 2).[10]

Table 2 : Lifestyle intervention for blood pressure reduction

Intervention	Recommendation	systolic blood pressure reduction
Weight reduction	Maintain ideal body mass index below23 kg/cm2	5-20 mm Hg per 10 kg weight loss
DASH eating plan	Consume diet rich in fruits, vegetables ,low –fat diary products with reduced content of saturated and total fat	8-14 mm Hg
Dietary sodium restriction	Reduce dietary sodium intake to<100 mmol/ day (2.4 g sodium or6 g sodium chloride)	2-8mm Hg
Physical activity	Engage in regular aerobic physical activity ,for example ,brisk walking for at lead 3o min most days	4-0 mm Hg
Alcohol moderation	Men's < 60ml per day twice a week Women <60 ml per day twice week	2-4mmHg
Tobacco	Total abstinence	_

The Dietary Approaches to Stop Hypertension (DASH) eating plan recommends a diet rich in fruits, vegetables, legumes, nuts & low saturated fats.

Increased salt intake is associated with higher blood pressure and reduction in salt consumption lowers blood pressure is a well-documented fact. Benefits of physical activity are also well known.

Different behavioral interventions with or without the DASH diet showed a significant reduction in 10 years risk of coronary heart disease in a follow up study of the PREMIER trial.[15]

Pharmacological treatment

Different trials like TROPHY, PHARAO, and CAMELOT with different pharmacological agents have been undertaken. But there is no convincing evidence that any antihypertensive for short duration changes the outcome of prehypertension.[16,17]

It is recommended that young people with prehypertension without risk factors should be managed only with lifestyle modifications and added pharmacotherapy should be given depending upon the presence of risk factors and co morbidities like diabetes mellitus.

Conclusion:

Individuals with prehypertension are prone to develop hypertension and are at increased risk of cardiovascular morbidity & mortality. Use of pharmacotherapy in treating prehypertension should be tailor made to the case. So, for now, healthy lifestyle is the fundamental line of treatment for prehypertension. With early detection and just lifestyle modifications many later complications can be avoided and people can live healthy long life without medications.

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