



RESEARCH ARTICLE

HYPERTENSION IN INDIA, A SYSTEMATIC REVIEW OF PREVALENCE 2016

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ABSTRACT

Hypertension is rapidly growing as a global epidemic, and affecting all age groups. It occurs when the flow of blood in the arteries increases beyond normal, as a result the heart has to function more. Continued pressure on the hearts makes it weak and the person suffers from heart diseases, often leading to heart attacks. The prevalence of hypertension is fast growing due to changes in living standards and sedentary lifestyles. This article emphasizes the increase in its prevalence. Awareness is an approach to deal with this disease.

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INTRODUCTION

Hypertension is defined as systolic blood pressure (SBP) of 140 mmHg or greater and/or diastolic blood pressure (DBP) of 90 mmHg or greater or any level of blood pressure in patients taking antihypertensive medication in adults aged more than 18 years. Blood pressure is chronically increased in the arteries developing hypertension. This hypertension is a major risk factor for many cardiovascular diseases. HTN is directly responsible for 57% of all stroke deaths and 24% of all coronary heart disease (CHD) deaths in India. It is the most common public health problem and often referred to as silent killer.

Major complications of hypertension include

- Kidney diseases
- End stage renal disease
- Hardened arteries
- Angina
- Left ventricular hypertrophy
- Left side heart failure
- Heart disease
- Heart attack
- Stroke
- Eye complications

- Retinal damage
- Death

Etiology of hypertension

- Genetic factors: polygenic inheritance and unhealthy environmental factors may be a causative factor.
- Body weight and height: hypertension increases with increasing weight and height.
- Age: increases steeply with age.
- Gender: rise is greater in men than women.
- Changes in renin angiotensin.
- Hyperinsulinemia.
- Dietary factors: excess fat, particularly saturated fat and cholesterol, refined carbohydrates, low intake of fruits and vegetables, low potassium, high sodium are some of the causative factors for increase of blood pressure.
- Sedentary lifestyle and lack of exercise.

Changes in prevalence of hypertension in the past years

1. The earliest study was done back in the year 1963 by Mathur et al. This study was conducted in Agra district of Uttar Pradesh, in which participants were above the age of 20. This urban population showed a prevalence of 3.98% among males and 6.64% among females (Indian Hypertension guideline – II 2.). A similar prevalence rate was found 3.50% and 3.69% in males and females respectively among rural Haryana subjects

in the year 1977. Study by Gupta SP (Indian Hypertension guideline –II). This shows that there was hardly any difference in prevalence among rural and urban people. The possible reason for this was changing lifestyle and fast growing urbanization in our country.

Classification of blood pressure and stages of hypertension in adults:

Classification	Blood pressure (SBP)	Blood pressure (DBP)
Normal (optimum)	120	80
Prehypertension (normal)	120-129	80-84
Prehypertension (borderline HT)	130-139	85-89
Hypertension	>140	>90
Hypertension (stage I)	140-159	90-99
Hypertension (stage II)	160-179	100-109
Hypertension (STAGE III)	>180	>110

Source: Joint National Committee on Hypertension (2003).

And then in the coming years this rate showed a constant rise in hypertension. In the recent year's improvement in economic status of the people has led to people living a more comfortable life, better food security and all this has led to less physical activity and lack of exercises. This in turn has given rise to a number of lifestyle related diseases and hypertension being one of them. Hypertension is alone not that serious but it gives rise to a number of other diseases. Therefore in the recent years the prevalence has increased a lot. Here are a brief of some of the studies. A cross sectional survey was conducted by Singh RB *et al* in 1997 in 20 randomly selected streets in Moradabad, North India. A total of 1806 subjects from North India (904 males and 902 females) age range 25-64 years. The survey methods were as follows: dietary diaries for 7 days food intake record; BP measurements; physician administered questionnaire and anthropometric measurements. Diagnosis of hypertension was based on new World Health Organization/International Society of Hypertension (WHO/ISH) criteria. Risk factors were assessed based on WHO guidelines. The prevalence of hypertension according to WHO/ISH criteria was 23.7% and by old WHO criteria 13.3% (Mohan V Prevalence, 2009). Another study was conducted by RB Singh *et al* in 1997. 1935 residents aged 25 years and above were selected of which 984 were men and 951 were female. Overall prevalence by WHO was found to be 4.6% and by JNCV criteria was 20.8% (Mohan V Prevalence, 2009). The Chennai Urban Rural Epidemiology Study (CURES) is one of the largest epidemiological studies on diabetes carried out in India, where 26,001 individuals aged > or = 20 years were screened using systematic random sampling method. It was conducted by Mohan v *ert.al* in 2007. Hypertension was diagnosed in all subjects who were on drug treatment for hypertension or if the blood pressure > or = 140/90 mmHg. Hypertension was present in 23.2% and 17.1% respectively men and women. Among the elderly population (aged > or = 60 years), 25.2% had isolated systolic hypertension. Age, body mass index, smoking, serum cholesterol and triglycerides were found to be strongly associated with hypertension. Among the total hypertensive subjects, only 32.8% were aware of their blood pressure, of these, 70.8% were under treatment and 45.9% had their blood pressure under control (Singh, 1997). In another study by S Yadav *et al* in 2008 showed a prevalence of 32.2% and prehypertension 32.3%. In this study a total of 1746 adults aged 30 and above were selected. They belonged to the urban population of Lucknow district (Yadav, 2008). In a study by

Midha *et al* in 2009, 800 subjects participated (355 men and 445 women) 400 from urban and 400 from rural areas, aged 20 years and above. The study was conducted in Lucknow district. The prevalence of hypertension was 32.8% in the urban population and 14.5% in the rural population (Midha). Another study named prevalence of high blood pressure among young rural adults in relation to height in childhood and adult body mass index was conducted by Kanade *et al* in 2011. 378 rural men older than 20 years who were measured for anthropometry during early childhood, adolescence, and as young adults in a community-based cohort study. At the young age of 24 years, 33.9% of men had either high systolic blood pressure (≥ 130 mmHg) or high diastolic blood pressure (≥ 85 mmHg), even in absence of obesity. Another study was conducted by R B Singh *et al* in 2011, the prevalence and risk factors for prehypertension and hypertension in 5 Indian cities. Prevalence of prehypertension and hypertension respectively was significantly greater in South India and West India compared to North India and East India. Older age, higher BMI, central obesity were observed among the patients (RB Singh, 1997). A study was conducted in 2012 by Sushil K. Bansal *et al*, the prevalence of hypertension and hypertension risk factors in a rural Indian community. Assessment was carried out in 1348 people aged 15 and above. 30.9% of cases were found to be hypertensive males and 27.8% females. Increasing age and BMI showed higher prevalence (Sushil, 2012). Another study by Gupta R *et.al* in 2012 was conducted among four urban and five rural locations. 1672 women were observed. Rural population showed a prevalence of 31.5% and urban 48.2%.low awareness about hypertension was observed. In another study by Biswas M *et al* 2011 Prevalence of prehypertension, hypertension, ISH and IDH in the study population was 19.28%, 17.93%, 8.07% and 6.72%, was found respectively. It was a door to door survey. The aim of this cross-sectional, community-based survey was to investigate the prevalence of hypertension, isolated systolic hypertension (ISH), isolated diastolic hypertension (IDH) and prehypertension according to sociodemographic features among the members of the households of the Scheduled Caste community of three selected villages (Chowgachha, Bagula and Chakdaha) of the District Nadia, West Bengal, India, in individuals aged 20-70 years (Midha). Another study by Sushil K. Bnasal, the prevalence of hypertension and hypertension risk factors in a rural Indian community: A prospective door to door study was published in Journal of Cardiovascular Disease Research 2012. In a sample of 1348, HTN was identified in 30.9% of the male population and 27.8% of females. Increasing age and higher body mass index were independent predictors of HTN in both sexes (Sushil, 2012).

Ajeet S Bhadoria in 2014 assessed the prevalence of hypertension and associated cardio vascular risk factors in Central India. Response rate was 97%. Overall prevalence was 17%. Urban population had a prevalence of 21.4% and rural 14.8%. Another study Burden and predictors of hypertension in India, by Youssef MK Farag. HTN was observed in 43.5% of the cohort and 41.5% of the subjects had blood pressure in the range of pre-hypertension (Farag, 2014). In a study published by ICMR-INDIAB in 2015, multistage sampling design was adopted. Tamil Nadu, Maharashtra and Jharkhand and union territory Chandigarh were included in the study. Overall age standarised prevalence of HTn was 26.3%. Prevalence in Tamil Nadu, Jharkhand, Chandigarh and Maharashtra 31.5%, 28.9%, 30.7% and 28.1%. Urban prevalence was higher than rural (ICMR-INDIAB, 2015). In a

recent study by M. Verma *et al* 2015, prevalence of hypertension and its association with different anthropometric variables among adults in rural areas of north India, the prevalence was 18.9% in the study subjects with 12.6% in stage I and 6.3% in stage II (Verma, 2015). Another study Socio-economic & demographic determinants of hypertension & knowledge, practices & risk behavior of tribals in India was conducted in 2015, It was a community based cross-sectional study carried out by the National Nutrition Monitoring Bureau (NNMB) by adopting multi-stage random sampling procedure. The study was carried out in 120 Integrated Tribal Development Authority (ITDA) villages in nine States viz. Andhra Pradesh, Gujarat, Karnataka, Kerala, Maharashtra, Madhya Pradesh, Odisha, Tamil Nadu and West Bengal during 2007-2008. A total of 47,401 [men (44.6%) and women (55.4%)] 20 yr were covered in the study. The prevalence of hypertension after age adjustment was 27.1 and 26.4 per cent among men and women, respectively. It was higher in the States of Odisha (50-54.4%) and Kerala (36.7-45%) and lowest in Gujarat (7-11.5%). The risk of hypertension was 6-8 times higher in elderly people and 2-3 times in 35-59 yr compared with 20-34 yr (Laxmaiah, 2015). Another study Prevalence of Hypertension and Determination of Its Risk Factors in Rural Delhi by Jugal Kishore *et al*. It was a community based cross-sectional study conducted in two rural areas in Delhi among 1005 subjects selected using systematic random sampling method. WHO STEPS approach was used to collect data. Blood pressure, body mass index, and blood sugar were measured. The prevalence of hypertension was 14.1% (142/1005) among study subjects (Jugal Kishore, 2016). In another study by Sebastian NM *et al* 2016, Hypertension in Kerala: A study of prevalence, control, and knowledge among adults, Data were obtained from a total of 1154 persons above the age of 30 years. Out of the 1154 individuals studied, 373 were identified as having hypertension giving a prevalence of 32.3%. Out of the 373 hypertensive subjects, 169 (45%) were undiagnosed at the time of the study and the remaining 204 (55%) were diagnosed by the time (Sebastian, 2016).

Management and Treatment of Hypertension

Behavior modification should be the first initiative in primary hypertension. Correct choices of food and lifestyle modification are important. Patients who cannot maintain normal levels despite dietary and life-style modification are prescribed medications. Dietary management is important even for such patients in order to avoid drug dependency, side effects and dosage. Relationship between diet and BP has been well established. Populations with vegetarian or low salt diets have lower BP. Lower BP has been correlated to higher intakes of potassium, calcium, magnesium, protein and fiber along with lower intakes of alcohol and fats.

Weight Reduction: hypertensives tend to be overweight, there is a strong positive association between the low. Weight reduction generally reduces systolic and diastolic BP levels, and is an important therapeutic measure. One should engage in 30 minutes of regular aerobic physical activity such as brisk walk.

Sodium restriction: sodium is found in almost all natural foods and is a common additive in many prepared and processed foods. Sodium requirements for both children and adults is less than 200mg per day, but people consume many times more 6-12g of salt per day (2.4 to 5g of sodium). The

mechanism of action is thought to involve reducing intravascular volume, vessel wall sodium content, or vascular reactivity. There is no known benefit of consuming extra salt, therefore it should be consumed less about 6g (2.4g of sodium). This level is achievable and palatable and adequately control BP in some patients with stage I hypertension.

Dietary pattern: Studies show that blood pressure is inversely related to intake of several nutrients like potassium, calcium, magnesium, protein, fiber etc. Vegetarians whose diet is high in fruits, vegetables, and low in animal fat and cholesterol have a lower blood pressure.

DASH diet: dietary approach to stop hypertension, this diet uses different food groups to create a dietary pattern that lowers blood pressure. Diet rich in fruits and vegetables, low fat dairy products and reduced content of saturated and total fat. This diet was found effective for patients with hypertension and non-hypertensives.

Conclusion

The study revealed that the prevalence of hypertension is continuously increasing in India; urban population is more affected due to sedentary lifestyle. India being a developing country where 70% of the under five children and 40% of adults are malnourished, hypertension that is generally a condition of developed nation, this picture shows that India is having a double burden of diseases. Healthy lifestyle, health education, and intervention programmed should be carried out to solve these problems.

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