

# Prevalence of Hypertension and its Association with Various Risk Factors- A Survey in Uttar Pradesh

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## ABSTRACT

**Introduction:** Hypertension is a well known disease amongst common people. 7 million premature deaths worldwide have been attributed to hypertension. It is predicted to affect more than 500 million people by 2025. Hypertension poses a significant health challenge financially too, contributing to 10% of total health burden. The present study was conducted with the main aim of finding the prevalence of hypertension and its risk factors in an area in Uttar Pradesh.

**Material and methods:** A survey was conducted in Uttar Pradesh between June,2015- September,2015. A total of 1000 subjects took part in the study. A predesigned performa was made and filled by all the subjects and clinical measurements like BMI, cholesterol levels etc were taken. Their blood pressures were measured and noted. SPSS software was used for analysis.

**Results:** The prevalence of hypertension came out to be 18%. Age, cholesterol levels, alcohol consumption emerged as independent risk factors for its causation.

**Conclusion:** Awareness and health education is highly needed for the people of Uttar Pradesh regarding the causes and manifestation of hypertension so that this disease can be curbed.

**Keywords:** Blood Pressure, Cholesterol, Hypertension, Independent.

## INTRODUCTION

Hypertension is a well known disease amongst common people as every third person is affected by the condition. According to a report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (JNC7) defines hypertension as blood pressure >140/90 mmHg. Persons with blood pressure above optimal levels, but not clinical hypertension (systolic blood pressure of 120-139 mm Hg or diastolic blood pressure of 80-89 mm Hg), are defined as having "prehypertension".<sup>1</sup> It is one of the prime health challenges worldwide because of its frequency and its associated risk of cardiovascular and kidney disease.<sup>2,3</sup> A meta analysis showed that lower values of blood pressure are also associated with increased risk of cardiovascular and kidney diseases.<sup>4,5</sup> Hypertension affects about 26% of the adult population worldwide.<sup>6,7</sup> million premature deaths worldwide have been attributed to hypertension.<sup>7</sup> Hypertension has been known to act as a important and independent predictor of cardiovascular, cerebrovascular diseases and deaths.<sup>8,9</sup> Various studies have been done at various places across the country which demonstrates an accelerating epidemic of hypertension in India. It is predicted to affect more than 500 million people by 2025.<sup>10</sup> Hypertension poses a significant health challenge financially too, contributing to 10% of total health burden.<sup>11</sup> As said prevention is better than cure, if conditions like hypertension can be prevented by lifestyle modifications than it will act as an asset for the society. Indian government has

launched national programmes for prevention and control of cancer, diabetes and cardiovascular disease and stroke to decrease the incidence of diseases at community level.<sup>12</sup> Information regarding the prevalence of the diseases acts as an important base step for the development of health policies at local and national levels. The present study was conducted with the main aim of finding the prevalence of hypertension and its risk factors in an area in Uttar Pradesh.

## MATERIAL AND METHODS

A community based survey was conducted by the Department, college, Uttar Pradesh between June,2015- September,2015. The sample size was selected on the basis of previous study which indicated prevalence of hypertension to be 15%.<sup>13</sup> A total of 1000 subjects were included and were divided into two groups-group I( non hypertensive) and Group II (Hypertensive). All the subjects were informed about the study and a written informed consent was obtained from all of them. Prior ethical clearance was also obtained from the concerned authorities. A predesigned performa was used and filled up by all the subjects. It had questions regarding age, sex, socioeconomic status, physical activity, alcohol and tobacco consumption etc. After collecting the demographic data, clinical measurements like cholesterol, high density lipoprotein level were measured. History of hypertension and diabetes was recorded. Blood pressure of all the subjects was noted three times in right arm in sitting position using mercury type sphygmomanometer. The average of three readings was taken for analysis. BMI of all the patients was calculated by the standard formula weight ( kgs)/height (m<sup>2</sup>). Overweight and obesity were defined as BMI  $\geq$  23–24.9 kg/m<sup>2</sup> and BMI  $\geq$  25 kg/m<sup>2</sup>, respectively.<sup>14</sup>

## STATISTICAL ANALYSIS

Chi square test was used for analysis of the data. P value of less than 0.05 was considered significant. SPSS software was used for the above purpose.

## RESULT

The prevalence of hypertension according to our study was 18% (180/1000) amongst the subjects. Table 1 reveals the demographic data such as age, sex, religion for both non hypertensive (n = 840) and hypertensive (n=140) groups. More

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subjects aged above 40 years were affected by hypertension than aged less than 40 years. The difference in age came out to be statistically significant. The predominant subjects affected by hypertension were Hindus. There was no significant difference in the socioeconomic status of the subjects affected by hypertension.

Table 2 illustrates the most common risk factors involved in the causation of hypertension. There was no significant difference in the tobacco intake between the two groups. In Group II (hypertensive) significantly larger population of subjects consumed alcohol compared to the non-hypertensive subjects i.e. around 32.8% individuals were alcohol consumers compared to 13.6% subjects who never consumed alcohol. Hypertension was found in 33.6% subjects with raised total cholesterol levels compared with 12.8% subjects with normal cholesterol levels. The difference came out to be statistically significant. A significantly higher number of individuals were overweight and obese in Group II compared to Group I. There was no significant difference in the physical activity status between the two groups. The level of HDL also showed statistically no significant difference ( $p$  values  $>0.05$ ) between Group I and Group II.

## DISCUSSION

The present study clearly demonstrates a higher prevalence of hypertension among individuals greater than 40 years of age. The results were in accordance with the study conducted by Islam et al<sup>15</sup>, which showed a higher prevalence of hypertension amongst adults aged greater than 25 years age in Bangladesh. A

study conducted by Vasan et al<sup>16</sup>, also demonstrated a significant correlation between age and hypertension. According to a study, the prevalence of hypertension in urban areas between the years 1960-1980 was 2.6 – 5.2%<sup>17,18</sup> which shot up to 20-33% in the last decade.<sup>19,20</sup> According to our study the prevalence came out to be 18% in Uttar Pradesh. According to our study only 48.2% of hypertensive patients were on anti-hypertensive medications. A study conducted by Kusuma<sup>21</sup> on the population of Delhi showed that 59% of the hypertensive subjects were on anti-hypertensive medications. According to our study there was no significant association between tobacco use and hypertension. This was in accordance with the study conducted by Jugal Kishore et al<sup>22</sup> which also showed no significant association between the two. According to a study by Fujun Wang et al<sup>23</sup> amongst people of China and India, tobacco didn't play a significant role as a risk factor in hypertension. On the contrary, according to Islam et al<sup>15</sup> tobacco acts as a significant risk factor in causation of hypertension. Alcohol has been reported as an independent risk factor for hypertension by various authors like SP Manimunda et al and RJ Khan et al.<sup>22</sup> This was in accordance with our study.

According to Framingham heart study<sup>23</sup>, excess body weight like overweight and obesity accounted for 26% and 28% cases of hypertension respectively amongst men and women. It was in accordance with our study as majority of individuals affected by hypertension were obese and overweight. According to our study there was no significant association between hypertension and physical activity which was contrary to a study conducted by Sunil et al<sup>23</sup> which showed a significant difference between

Variable	Subgroup	Nonhypertensive		Hypertensive		p value
		N = 820	%	N=180	%	
Gender	Male	266	82.09	58	17.91	>0.05
	Female	554	81.9	122	18.1	>0.05
Age	Less than 40 Yrs	231	83.3	26	16.7	<0.05
	More than 40 yrs	589	79.2	154	20.8	<0.05
Religion	Hindu	721	84.4	133	15.6	<0.05
	Others	99	67.8	47	32.2	<0.05
Socioeconomic status	Upper class	52	68.4	26	31.6	>0.05
	Middle class	490	82.3	105	17.7	>0.05
	Lower class	298	85.8	49	14.2	>0.05

**Table-1:** Demographic variables associated with the study

Variable	Subgroup	Nonhypertensive		Hypertensive		P value
		N=820	%	N=180	%	
Tobacco use	Yes	123	76.3	38	23.7	>0.05
	No	697	83.1	142	16.9	>0.05
Alcohol use	Yes	156	67.2	76	32.8	<0.05
	No	664	86.4	104	13.6	<0.05
Total cholesterol	Normal	652	87.2	95	12.8	<0.05
	Raised	168	66.4	85	33.6	<0.05
HDL	Normal	53	82.8	11	17.2	>0.05
	Raised	767	81.9	169	18.1	>0.05
BMI	Underweight	90	83.3	18	16.7	>0.05
	Normal	268	86.7	41	13.3	>0.05
	Overweight	111	71.1	45	28.9	<0.05
	Obese	324	81	76	19	<0.05
Physical activity	Yes	654	84.1	123	15.9	>0.05
	No	166	74.4	57	25.6	>0.05

**Table-2:** Risk factors associated with hypertension

hypertension and leisure time physical inactivity. A raised cholesterol and triglyceride level play a significant role as a modifiable risk factor in hypertension. Our results were similar to the results shown by previous studies.<sup>24</sup> Dietary factors though not evaluated in our study play an important role in causation of hypertension especially high salt intake.<sup>23</sup> Though this study tried to estimate the various modifiable and non modifiable risk factors for hypertension but various factors like dietary salt intake, type of physical activity could not be assessed by this study. A detailed evaluation is necessary to estimate the risk factors and their association with hypertension.

## CONCLUSION

Our study shows a high prevalence of hypertension amongst people of Uttar Pradesh. Age, alcohol consumption, cholesterol levels act as independent risk factors for hypertension. Education level of people needs to be raised in order to decrease the prevalence of the disease. Various health policies need to be adopted by the government to prevent an alarming increase in the prevalence of the disease.

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