

## Original Research Article

# Prevalence of hypertension and associated factors in males: a cross sectional study in Prayagraj District, Uttar Pradesh

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## ABSTRACT

**Background:** A disorder that has no apparent symptoms but later results in serious health problems can pose great threat to the health of people. Hypertension is such a major non communicable disease (NCD) and affects about 20% of the population in most communities. Hypertension has a major hand in causation of coronary artery diseases, stroke and various other vascular complications, and renal disorders. The study was done with objective to assess prevalence of hypertension of male which were  $\geq 30$  years in Urban and Rural Prayagraj.

**Methods:** A community based cross-sectional study was carried out in Prayagraj District. Study participants were 620 males, 310 urban and 310 rural of age equal or above 30 years and study sampling technique were two stage random sampling. The data was collected by using predesigned, pretested, semi structured questionnaire and analyzed by using SPSS 23.0 version.

**Results:** Prevalence of hypertension was 41.13%. A statistically significant association of hypertension was found with hypertension and BMI, lifestyle, salt consumption, dietary preference and amount of vegetable/fruit each.

**Conclusions:** A high prevalence was found in this study when compared with others study. BMI, lifestyle, salt consumption, dietary preference and amount of vegetable were found to be significantly association risk factors for hypertension among males in Allahabad district.

**Keywords:** Hypertension, Rural and urban

## INTRODUCTION

A disorder that has no apparent symptoms but later results in serious health problems can pose great threat to the health of people. Hypertension is a non-communicable disease (NCD) that affects about 20% of the population in most communities. Hypertension has a major hand in causation of coronary artery diseases, stroke and various other vascular complications, and renal disorders.<sup>1</sup>

Worldwide, raised blood pressure is estimated to cause 7.5 million deaths, about 12.8% of the total of all deaths. This accounts for 57 million disability adjusted life years

(DALYs) or 3.7% of total DALYs. Globally, the prevalence of raised blood pressure in female aged 18 and over was around 20% and males around 24%. The proportion of the world's population with high blood pressure, or uncontrolled hypertension, fell modestly between 1980 and 2008. However, because of population growth and ageing, the number of people with uncontrolled hypertension rose from 600 million in 1980 to nearly 1 billion in 2008.<sup>2</sup> In 2002, 10.9% of all deaths in the developed countries were attributable to hypertension, making it the second major risk factor of overall death just below tobacco use (12.2%) but over high cholesterol (7.6%), alcohol use (9.2%) and obesity (7.4%).<sup>3</sup> In addition, about half of all cardiovascular

disease (mortality and morbidity combined) is attributable to high blood pressure. Fortunately, it is widely considered as one of the most preventable causes because of the availability of effective antihypertensive drugs. In 2003, \$30 billion was spent on antihypertensive drugs in the US, which is about 18% of the costs of all prescription drugs.<sup>3</sup> Using these drugs effectively, every 20 mmHg decrease of systolic blood pressure and 10 mmHg decrease of diastolic blood pressure could potentially lead to a 50% reduction of the risk of cardiovascular disease according to the World Health Organization, although other non-blood pressure related effects of pharmacological treatment may alter these figures.<sup>3</sup>

Compared to no treatment, antihypertensive have demonstrated to reduce the risk of major cardiovascular events with 27%, the risk of cardiovascular mortality with 16% and the risk of all cause mortality with 10%.<sup>4</sup> Although high blood pressure has long been identified as an important medical condition, until 1964, the most important strategy for decreasing a patient's blood pressure was a low salt diet.<sup>5</sup>

The prevalence in India as per the study by Indian Council of Medical Research (ICMR) was 25% among urban population and 29% among rural population when systolic BP of 140 and above and/or diastolic BP of 90 or above were considered as hypertension.<sup>6</sup> According to NCD risk factor survey conducted by Integrated Disease Surveillance Project (IDSP), during 2007–2008, the prevalence of hypertension in India varied between 17% and 20%.<sup>7</sup> Anchala et al have found 29.8% prevalence of hypertension in India in year 2013 along with 27.6% and 33.8% prevalence of hypertension in rural and urban populations respectively.<sup>8</sup>

A lot of studies had been conducted worldwide including India for the study of the hypertension in the study group. However, very few hospital based studies on hypertensive had been found in Allahabad District and had not been done community based (field study) study and seen on concerned topic. Objectives of the study were to study the prevalence of hypertension among males 30 years and

above in Allahabad district and to study the risk factors associated with hypertension.

## METHODS

A community based cross-sectional study was carried out in Prayagraj District from September 2018 to September 2019. Allahabad district was divided first in four quadrants and the list of ward in urban areas and villages in rural areas were drawn. One ward in urban area and one village in rural area were selected from each quadrant. For the selection of study participants, first house was selected randomly (Pen drop method) from the selected wards/villages. Then moving in a fixed direction, subsequent participants fulfilling eligibility criteria were selected from other household to achieve the required sample size for that ward/village.

In case, the required sample size for each selected ward or village was not achieved, then the next nearby ward or village was selected for completion of sample size. The data was analyzed using statistical software, SPSS Version 23. Chi-square tests was used to test the associations between the different variables. P-value less than 0.05 was considered as significant. This study has been approved by the institutional ethics committee, M.L.N Medical College, Prayagraj.

### Inclusion criteria

All the males aged 30 years or above were included.

### Exclusion criteria

Those who were not willing to participate and having any emergency condition were excluded.

## RESULTS

A total of 310 study participants were studied from urban and rural areas each. It can be seen that majority of participants 109 (35.16%) in urban areas belong to age group 30-39 years.

**Table 1: Socio-demographic profile of study participants.**

Socio-demographic profile	Urban (n=310)		Rural (n=310)		
	N	%	N	%	
Age group (years)	30-39	109	35.16	49	15.81
	40-49	67	21.61	81	26.13
	50-59	55	17.74	81	26.13
	60-69	36	11.61	70	22.58
	≥70	43	13.87	29	9.35
Religion	Hindus	298	96.13	284	91.61
	Muslims	12	3.87	26	8.39
Caste category	General	113	36.45	52	16.77
	OBC	163	52.58	229	73.87
	SC/ST	34	10.97	29	9.36

**Table 2: Distribution of hypertensive participants according to their socioeconomic status.**

Socioeconomic status	Urban (non-hypertensive)	Urban (hypertensive)	P value	Rural (non-hypertensive)	Rural (hypertensive)	P value
	N (%)	N (%)		N (%)	N (%)	
<b>Upper class</b> (U - 79, R - 19)	50 (63.29)	29 (36.71)	0.433149	4 (21.05)	15 (78.95)	<0.00001
<b>Middle class</b> (U - 112, R - 57)	62 (55.36)	50 (44.64)		38 (66.67)	19 (33.33)	
<b>Lower class</b> (U - 79, R - 177)	65 (54.62)	54 (45.38)		166 (70.94)	68 (29.05)	

**Table 3: Relationship of hypertension with BMI, lifestyle and dietary practices.**

Factors	Urban (non-hypertensive)	Urban (hypertensive)	P value	Rural (non-hypertensive)	Rural (hypertensive)	P value
	N (%)	N (%)		N (%)	N (%)	
<b>BMI</b>	Underweight <18.5 (U - 22, R - 30)	16 (72.73)	6 (27.27)	24 (80)	6 (20)	0.00282
	Normal 18.5 - 24.99 (U - 153, R - 181)	107 (69.93)	46 (30.07)	116 (64.09)	65 (35.91)	
	Overweight ≥25.00 - 29.99 (U - 115, R - 78)	52 (45.22)	63 (54.78)	44 (56.41)	34 (43.59)	
	Obese ≥30.00 (U - 26, R - 21)	2 (10)	18 (90)	4 (19.05)	17 (80.95)	
<b>Lifestyle</b>	Sedentary (U - 94, R - 78)	20 (21.28)	74 (78.72)	16 (20.51)	62 (79.49)	<0.00001
	Moderate (U - 141, R - 119)	89 (63.12)	52 (36.88)	73 (61.34)	46 (38.66)	
	Heavy (U - 75, R - 113)	68 (90.67)	7 (9.33)	99 (87.61)	14 (12.39)	
<b>Salt consumption</b>	0-5 gm (U - 96, R - 114)	77 (80.21)	19 (19.79)	87 (76.32)	27 (23.68)	<0.00017
	≥6 gm (U - 214, R - 196)	100 (46.73)	114 (53.27)	101 (51.53)	95 (48.47)	
<b>Dietary preference</b>	Vegetarian (U - 233, R - 303)	157 (67.38)	76 (32.62)	187 (61.72)	116 (38.28)	0.083169
	Non-vegetarian (U - 77, R - 8)	20 (25.97)	57 (74.03)	2 (25)	6 (75)	
<b>Amount of vegetables and fruits / day</b>	≤400 gm (U - 233, R - 260)	116 (49.79)	117 (50.21)	148 (56.92)	112 (43.08)	0.002221
	>400 gm (U - 77, R - 50)	61 (79.22)	1 (20.78)	40 (80)	10 (20)	

Whereas majority of participants in rural areas 81 (26.13%) each belong to the age group of 40-49 years and 50-59 years. 298 (96.13%), were Hindu. Similarly, in rural areas the most of the participants were 284 (91.61%) Hindu. A total of 12 (3.87%) in urban areas and 26 (8.39%) in rural areas were practicing Islam. 163 (52.58%) belong to OBC caste category followed by General category i.e., 113 (36.45%) participants and SC/ST category 34 (10.97%) participants. Similarly in rural areas the most common caste category observed was

OBC with 229 (73.87%) participants. A total of 52 (16.77%) participants belonged to General category and 29 (9.36%) participants belonged to SC/ST caste category in rural areas. Association between socioeconomic status and hypertensive state of study participants was found to be statistically significant in rural areas (chi-square=40.624, p<0.00001) but no association was found in urban areas (Chi-square=1.6733, p=0.433149).

In urban area 90% were hypertensive among the obese category participants and only 27.27% were hypertensive among underweight category patients whereas in rural areas, 80.95% were hypertensive among the obese category participants. In urban areas among participants who were having sedentary lifestyle, 78.72% were hypertensive whereas in rural areas among participants who were having sedentary lifestyle, 79.49% were hypertensive. High percentage of hypertensive participants were in  $\geq 6$  mg category of salt, preference of non-vegetarian diet and consumed  $\leq 400$  mg of fruit and vegetable in both urban areas and rural areas.

## DISCUSSION

The prevalence of hypertension estimated in Allahabad in the present study was much higher than that estimated for Nellore (22.3%) but almost similar as that in Bihar (37.95%) in other study. Singh et al found the prevalence of hypertension in urban areas of Varanasi to be 41.7% in their study.<sup>9-11</sup>

Urban areas had more prevalence of hypertension in the present study population in comparison of rural areas. Tabrizi et al found that urban residency was associated with increased risk of hypertension. A higher urban prevalence of hypertension was also reported in a multi center study among elderly people in Bangladesh and India.<sup>11-14</sup>

Leng et al found an overall increased risk of hypertension among the lowest SES.<sup>15</sup> The associations were significant in high-income countries, and the increased risk of hypertension for the lowest categories of all SES indicators. In urban area no association was found between socio-economic status and hypertension but present in rural areas in this study.

In urban area, overweight participants had twofold risk of being hypertensive and obese had three fold risk for the same in comparison to under-weight participants in this study. Similarly, Singh et al found overweight and obesity measured by both BMI. Overweight subjects had twofold risk of being hypertensive and obese had more than three fold risk for the same in comparison to under-weight subjects in their study.

According to this study there was statistically significant association between hypertension and physical activity which was similar to a study conducted by Sunil et al which showed a statistically significant association between hypertension and leisure time physical inactivity. Similar finding was reported by Malhotra et al.<sup>16,17</sup>

The WHO strongly recommended to reduce dietary salt intake as one of the top priority actions to tackle the global non-communicable disease crisis. In this study had also found same result.

Amount of vegetable and vegetarian diet showed statically significant association with hypertension. Singh S et al found although not statistically significant, odds of being hypertensive were more among non-vegetarian (OR: 1.10) participants, while vegetarian diet was proved to be protective against hypertension in their study.

## CONCLUSION

A total number of 133 males in urban and 122 in rural areas were found to be hypertensive in the selected sample. Hypertension was found to be association with BMI, life style, salt consumption, amount of vegetable/fruit intake in both urban and rural areas. Also, dietary preferences were found to be associated with hypertension in urban area and socio economic status was found to be associated with hypertension in rural area.

### *Strengths and limitations*

Most morbidity was elicited by asking questions, self reporting and simple clinical examination without any further confirmation by other laboratory investigations, because of which morbidity may have been underestimated or missed.

The strength of the study lies in the fact that very few comparative studies have been done on male participants to assess the morbidity pattern in Northern India, which will help to specify the need of non-hypertensive, pre hypertensive and hypertensive in these areas which will further contribute in strengthening the on-going preventive and curative aspect of health services and better utilization of them.

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