

# A CROSS SECTIONAL STUDY OF PREVALENCE OF HYPERTENSION AND ASSOCIATED RISK FACTORS AMONG TRIBAL POPULATION

**Dr. Gaurav Kistaiah<sup>1\*</sup>, Dr. Gajendra Singh Sisodia<sup>2</sup>, Indu Tomar<sup>3</sup>**

<sup>1\*</sup> Associate Professor, Department of Community Medicine, National Institute of Medical Sciences and Research (NIMS&R), Jaipur, Rajasthan.

<sup>2</sup> Assistant Professor, Department of Community Medicine, National Institute of Medical Sciences and Research (NIMS&R), Jaipur, Rajasthan.

<sup>3</sup> Research Scholar, Department of biosciences, Manipal University, Jaipur, Rajasthan.

**Corresponding Author: Dr. Gaurav Kistaiah**

**Associate Professor, Department of Community Medicine, National Institute of Medical Sciences and Research (NIMS&R), Jaipur, Rajasthan.**

## Abstract

**Introduction:** Hypertension (HTN) is a major public health challenge across the world and is a major cause for mortality as well as disability-adjusted life years. The health problems of the people are closely associated with various socioeconomic factors including lifestyle of the people. With 29.8% overall, 33.8% urban and 27.6% rural area prevalence, HTN is a major public health problem and a leading non-communicable disease (NCD) in India.

**Materials and Methods:** A cross-sectional study was conducted at the Department of Community Medicine, National Institute of Medical Sciences and Research (NIMS&R), Jaipur, Rajasthan from January 2022 to December 2022. The study subjects were interviewed at their house and all information recorded in the pre-designed and pretested schedule. A second home visit was given to collect data when people who were not able to be contacted on first occasion. Altogether 410 subjects consented for the study. Age, sex, education, occupation, socio-economic status, religion, additional salt intake, physical activity, body weight, height, body mass index (BMI) and blood pressure were taken as different variables for this study.

**Results:** Out of the 410 participants, 66 (16 %) subjects were having hypertension. Subjects with age above 49 years were having high proportion (20.6 %) of hypertension in comparison to age less than 49 years. In comparison to females (12.1%), males were having higher proportion (18.6%) of hypertension. It appeared from the Table 2 that out of 66 hypertensives, 30.3 percent participants were taking additional salt, 22.2 percent were involved in drinking alcohol and 43.5 percent were smokers. The hypertension proportion was highest in participants with body mass index >25 (36.4%) among all variables. The role of Risk factors like age, gender, BMI, extra salt intake, and alcohol drinking in development of hypertension among study population was found to be statistically significant ( $p < 0.01$ ).

**Conclusion:** The prevalence of hypertension among tribal population in a rural area was found to be high. They appear equally affected by the changing lifestyle due to migration, acculturation and urbanization overshadowing their heavy working attitude

**Key words:** Hypertension, non-communicable disease, BMI, alcohol drinking.

## INTRODUCTION

Hypertension (HTN) is a major public health challenge across the world and is a major cause for mortality as well as disability-adjusted life years. The health problems of the people are closely associated with various socioeconomic factors including lifestyle of the people.<sup>1</sup> With 29.8% overall, 33.8% urban and 27.6% rural area prevalence, HTN is a major public health problem and a leading non-communicable disease (NCD) in India.<sup>2</sup> It is a major leading cause for mortality in India for more than 2 decades mainly due to unhealthy diets leading to high blood pressure (BP) as a consequence of atherosclerosis coupled with obesity, lack of physical work, etc. There is a widespread misconception that the cardiovascular diseases in the developing countries affect mostly the richer persons.<sup>3</sup>

With modern medical care, increase in life expectancy, change in lifestyle and behavioural pattern, the prevalence of hypertension will continue to increase. The high blood pressure has always been considered as ‘Silent Killer’. On most occasion people are unaware about the disease and it may have no warning sign and symptoms. Therefore, early detection is very important to reduce morbidity and mortality of the disease. One can easily be detected as hypertensive by their blood pressure measurement, which is very easy, painless and least expensive. Detection, treatment and control of hypertension are an important health priority worldwide.<sup>4</sup>

It is usually presumed that tribal population are least exposed to risk factors like decreased physical activity and obesity by virtue of their occupation, but the other side of the coin suggests that the risk factors like smoking and alcohol consumption is increasing among these lower socioeconomic strata. Data from NSSO, 52nd round showed that tobacco intake (smoking and non-smoking) and alcohol usage are higher in the poorest 20% percent of income quintile. The unawareness regarding the different risk factors is quite common among rural population resulting in delayed or no screening for high blood pressure.<sup>5</sup>

## MATERIALS AND METHODS

**Study design:** A cross-sectional study.

**Study location:** Department of Community Medicine, National Institute of Medical Sciences and Research (NIMS&R), Jaipur, Rajasthan.

**Study Duration:** January 2022 to December 2022.

**Sample Size:** 410 patients.

A cross-sectional study among tribal population in a rural area of Rajasthan state was carried out in 2021 including all persons with age of 18 years and above.

**Inclusion Criteria:** All tribes with age of 18 years and above were included in the study irrespective of their hypertensive status.

**Exclusion criteria:** People who were unavailable at the second home visit have been excluded from the study.

The study subjects were interviewed at their house and all information recorded in the pre-designed and pretested schedule. A second home visit was given to collect data when people who were not able to be contacted on first occasion. Altogether 410 subjects consented for the study. Age, sex, education, occupation, socio-economic status, religion, additional salt intake, physical activity, body weight, height, body mass index (BMI) and blood pressure were taken as different variable for this study.

According to The seventh report of Joint National Committee on prevention, detection, evaluation and treatment of high blood pressure, the participants were grouped as hypertensives. Body weight was measured (to the nearest 0.5 Kg) with the subject standing motionless on the weighing scale, about 15 cm apart, and weight equally distributed on each leg without foot wear and minimum clothes. Height was measured (to be nearest 0.5 cm) with the subject in an erect position against vertical surface and with the head positioned so that the top of the external auditory meatus will be level with inferior margin of bony orbit. People taking additional salt separately while taking food or taking salty preparations like prickles, preserved sauces and other food stuffs had been grouped as additional salt takers.

**Statistical Analysis:** Statistical analysis of the data collected was carried out using SPSS 20.0. Beside descriptive statistics, Chi- Square test done to find significance of risk factors in association with development of hypertension. A Binomial logistic regression was performed to explain the impact of predictor variables in terms of odds ratios. The Omnibus Tests of Model Coefficients test was done to judge the fit of the model to data and pseudo R square value (Cox & Snell R Square & Nagelkerke R square value) was calculated to know the variation in the outcome.

## RESULTS

Out of the 410 participants, 66 (16 %) subjects were having hypertension. Subjects with age above 49 years were having high proportion (20.6 %) of hypertension in comparison to age less than 49 years. In comparison to females (12.1%), males were having higher proportion (18.6%) of hypertension. It appeared from the Table 2 that out of 66 hypertensives, 30.3 percent participants were taking additional salt, 22.2 percent were involved in drinking alcohol and 43.5

percent were smokers. The hypertension proportion was highest in participants with body mass index >25 (36.4%) among all variables. The role of Risk factors like age, gender, BMI, extra salt intake, and alcohol drinking in development of hypertension among study population was found to be statistically significant ( $p < 0.01$ ).

S.No	Age group	N=410	Percentage
1	18-29 years	76	19%
2	30-39 years	64	15%
3	40-49 years	95	23%
4	50-59 years	91	22%
5	≥60 years	84	20%

**Table 1: Age distribution**

S.No	Gender	N	Percentage
1	Male	228	55%
2	Female	182	45%

**Table 2: Gender distribution**

S.No	Occupation	N	Percentage
1	Agriculture	185	45%
2	Unskilled labour	126	30%
3	Skilled labour	53	13%
4	Student	30	7%
5	Unemployed	17	4%

**Table 3: Occupation status**

S.No	Socioeconomic Class	N	Percentage
1	Middle	26	6.5%
2	Lower middle	52	12.8%
3	Lower class	331	80.7%

**Table 4: Socioeconomic Class**

		Total subjects (Out of N=410)	Hypertensives	%	P value
<b>Prevalence</b>		<b>410</b>	<b>66</b>	<b>16%</b>	
Age group	<49	235	29	12%	0.001
	>49	175	36	20%	
Gender	Male	228	42	18%	0.002
	Female	182	22	12%	
BMI	<25	371	50	14%	0.001
	>25	38	14	37%	
Additional salt intake	Yes	38	12	30%	0.001
	No	372	53	13%	

Smoking	Yes	69	35	43%	0.002
	No	341	30	9%	
Drinking Alcohol	Yes	237	52	22%	0.001
	No	173	12	7%	

**Table 5: Hypertension and risk factors****DISCUSSION**

The prevalence in this study (16%) is close to the study of tribal labour population of Rajasthan with prevalence of hypertension was found to be 16.9 percent. In contrast to our study, among aboriginal Nicobarese tribes living in Car Nicobar Island, India has documented high prevalence of hypertension (50.5%). The non-modifiable risk factors of hypertension such as age and gender have always been held responsible for hypertension.<sup>6</sup>

The present study results also matched to the results of previous other studies for non-modifiable risk factors. Among primitive tribes of Orissa, the study reported prevalence of hypertension among males and females as 31.8 percent and 42.2 percent respectively while in our study it was found to be 18.6 percent and 12.1 percent respectively.<sup>7</sup>

The high prevalence of hypertension in persons aged 49 years and above (20.6%) is consistent with the study of Mungreiphy N. K et al that blood pressures increased with age steadily from the youngest to the oldest age group among Tangkhul Naga tribal males of north east India. Even WHO has reported that virtually all surveys have shown a rise in blood pressure with increasing age in both genders. This could be attributed to the decreased compliance of arterial wall and left ventricular diastolic dysfunction changes. However, Khadilkar AH et al did not find any statistical difference in the prevalence of hypertension between males and females.<sup>8</sup>

The Modifiable risk factors has played most important role in increasing the burden of disease and also, they may result in reducing it if they are identified early and people are aware about it. Most of the studies in India and abroad have tried to find the relationship between obesity and hypertension. Our study comprises of only 77 subjects (9.4%) with high BMI (>25). The lower percentage of high BMI in the study population may be due to their occupation as agriculture. But the association of BMI and hypertension has been found to be statistically significant ( $\chi^2 = 27.28$ ,  $df=1$ ,  $p<.0001$ ).<sup>9</sup>

Demographic findings revealed that the habits of smoking and alcohol intake are quite common in these tribes. This may be due to the adoption of modern lifestyle and behaviour change. Higher prevalence of hypertension was reported in smokers when compared to non-smokers by Malhotra P et al. and Gupta R et al. In our study also, smoking has emerged as most important risk factor in tribes with odds of developing hypertension being as high as 10.1 for smokers (table 3).<sup>10</sup>

## CONCLUSION

A prevalence of 16% indicates that our country's rural areas are also seeing a quick transformation in terms of lifestyle diseases. Although traditional populations around the world were often thought to have low blood pressure, a marked increase in blood pressure has been observed as the socioeconomic environment has changed. Tribal groups are particularly vulnerable since they continue to reside in rural places with limited access to health care and poor health-seeking habits. The current pattern of growing hypertension prevalence strongly underscores the necessity for India to implement consistent hypertension control techniques. All people must be screened for hypertension (either opportunistic or targeted approach) at every point of contact with health professionals or allied health employees.

## REFERENCES

1. National Family health Survey-4. Govt. of India, Ministry of Health and Family Welfare, New Delhi. 2018.
2. Guidelines for the treatment of mild hypertension:Memorandum from a WHO/ISH meeting Bull World Health Organization 1983;61(1):53-61.
3. Chobanian AV, Bakris GL, Black HR, et al. The Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation and Treatment of High blood Pressure: The JNC 7 Report. JAMA 2003;289(19):2560-72.
4. Tiwari RR. Hypertension and epidemiological factors among tribal labour population in Gujrat. Indian Journal of Public Health 2008;52(3):144-6.
5. Manimunda SP, Suguman AP, Benegal V, et al. Association of hypertension with risk factors and hypertension related behavior among the aboriginal Nicobarese tribe living in Car Nicobar Island, India. Indian Journal of Medical Research 2011;133(3):287-93.
6. Kerketta AS, Bulliyya G, Babu BV, et al. Health status of elderly population among four primitive tribes of Orissa in India: a clinico-epidemiological study. Z Gerontol Geriatr 2009;42(1):53-9.
7. Mungreiphy NK, Kapoor S, Sinha R. Association between BMI, blood pressure, and age: study among Tangkhul Naga tribal males of Northeast India. Journal of Anthropology 2011;2011:748147.
8. Dash SC, Swain PK, Sundaram KR, et al. Hypertension epidemiology in an Indian Tribal population. J Assoc Physicians India 1986;34(8):567-70.
9. Khadilkar HA, Ghattargi CH, Thite GH. Study of prevalence of hypertension and Socio demographic factors in rural community of Maharashtra. South Asian J of Prev Cardiology 2004;8(4):205-10.
10. Park K. Hypertension. Textbook of Preventive and Social Medicine. 25th edn. Jabalpur: M/S Banarasi Das Bhanot Publishers 2019: p. 405.