Original Research Article

A Cross Sectional Study of Prevalence of Hypertension & Associated Risk Factors Among Tribal Population

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Abstract

Introduction: As per World health organization report (2008), about 40% of people aged more than 25 years had hypertension. Worldwide, 7.6 million premature deaths were attributed to high blood pressure. Overall prevalence of hypertension in India in 2013 was 29.8% which was significantly different b/w rural and urban population. NNMB tribal survey (2008-09) estimated the prevalence of hypertension among man and women was 25% and 23% respectively.**Material and Methods:** A cross-sectional study among tribal population in a rural area of Guntur district in Andhra Pradesh state was carried out in 2020 including all persons with age of 18 years and above. All tribes with age of 18 years and above were included in the study irrespective of their hypertensive status. 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. People who were unavailable at the second home visit have been excluded from the study. 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. **Results:** There are no any upper and upper middle-class people in study population and 80.7 percent participants belong to Lower class according to Pareek's method of socioeconomic classification. Out of the 410 participants, 65 (15.7 %) subjects were having hypertension (Table 2). 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 6 that out of 65 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 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.

Keywords: NNMB tribal survey, BMI, hypertension, tribal population.

Introduction

Non communicable diseases (NCDs) refer to chronic diseases of long duration and generally with slow progression and which does not pass from person to person[1,2]Most common types of non-communicable diseases are cardiovascular diseases, diabetes, chronic respiratory diseases (such as chronic obstructive pulmonary disease and asthma) and cancers. NCDs are most common cause of death and disability in world. Among these hypertension is most recognized modifiable risk factor of CVD, stroke and end stage renal disease. According to JNC-7 systolic blood pressure >140 mm Hg and diastolic >90 mm Hg is considered as high blood pressure[2-4].As per World health organization report (2008), about 40% of people aged more than 25 years had hypertension. Worldwide, 7.6 million premature deaths were attributed to high blood pressure[5-7]. Overall prevalence of hypertension in India in 2013 was 29.8% which was significantly different b/w rural and urban population.NNMB tribal survey (2008-09) estimated the prevalence of hypertension among man and women was 25% and 23% respectively[8]. A study carried out by Meshram et al, found 37% (as per JNC VII) prevalence of hypertension among adult tribal population of Kerala. Hypertension is also directly responsible for 57% of all stroke and 24% of all coronary heart disease (CHD) related deaths in India[9].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[10].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[11].We wanted to determine the prevalence of hypertension among tribes.

Materials and Methods

A cross-sectional study among tribal population in a rural area of Guntur district in Andhra Pradesh state was carried out in 2020 including all persons with age of 18 years and above. All tribes with age of 18 years and above were included in the study irrespective of their hypertensive status. 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. People who were unavailable at the second home visit have been excluded from

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the study. 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. Two measurement of blood pressure were taken on each study participant with a mercury column sphygmo-manometer. Both blood pressure measurements were obtained after subject had rested for at least 5 minutes in a seated position. A WHO study group recommended the sitting position than the supine position for recording blood pressure. The first blood pressure measurement was recorded after obtaining the socio-demographic information from the study subject, while the second was recorded after a brief clinical examination. All blood pressure measurements were on the left arm of each study subject, using cuff of appropriate size at the level of the heart. The cuff pressure was inflated 30 mm Hg above the level at which the radial pressure disappears, and then deflated slowly at the rate of about 2 mm per second and the readings recorded to the nearest 2 mmHg. The first (appearance) and the fifth (disappearance) Korotkoff sounds were recorded as indicative of systolic and diastolic blood pressure (SBP and DBP) respectively.The average of the two recordings of SBP and DBP were used to describe the blood pressure of the participants. In case where the two readings differed by over 10 mmHg then a third reading was taken and average of three measurements was taken as blood pressure of the subject. Those people who are on medication for the hypertension were also considered as hypertensives. 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.[8] 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 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.

Results

There are no any upper and upper middle-class people in study population and 80.7 percent participants belong to Lower class according to Pareek's method of socioeconomic classification. Out of the 410 participants, 65 (15.7 %) subjects were having hypertension (Table 2). 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 6 that out of 65 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 be statistically significant ($p<0.01$).

A binary logistic regression was performed to ascertain the effects of age, BMI, Sex, additional salt intake, smoking, drinking alcohol on the likelihood that the subjects have hypertension (Table 6). The Omnibus Tests of Model Coefficients indicates that the fit of the model to data has significantly improved by including different risk factors as an explanatory variable ($x2 =157.94$, $df=6$, $p<.001$). The Classification Table including the explanatory variables shows that 85.4% are correctly classified. The Model Summary reflects (Pseudo R Square) that 17.5 % to 30.1% of variation in the outcome can be explained by this model and it is significantly better fit model than null model.

Table 1: Age Distribution

C	Variables	N=410	Percentage
1	Age group in years		
2	18-29	76	18.5%
3	30-39	65	15.7%
4	40-49	95	23.0%
5	50-59	92	22.3%
6	≥60	84	20.4%

Table 2: Gender distribution

S.No	Gender	Number of patients	Percentage
1	Male	228	55.6%
2	Female	182	44.4%

Table 3: Educational status

S.No	Education	Number of patients	Percentage
1	Illiterate	68	16.6%
2	Just literate	110	26.7%
3	Primary school	100	24.4%
4	Middle school	57	13.9%
5	High school	59	13.3%
6	Above high school	21	5.1%

Table 4: Occupation status

S. No	Education	Number of patients	Percentage
1	Agriculture	184	45%
2	Unskilled labour	126	30.7%
3	Skilled labour	53	12.9%
4	student	29	7.2%
5	House wife	17	4.1%

Table 5: Socioeconomic Class

S. No	Socioeconomic Class	Number of patients	Percentage
1	Middle	26	6.5%
2	Lower Middle	52	12.8%
3	Lower class	331	80.7%

Table 6: Hypertension and Risk Factors

		Total subjects (out of 410)	Hypertensives	%	P Value
Prevalence		410	65	15.7%	
Age groups in year	<49 years	235	29	12.1%	0.001
	>49 years	175	36	20.6%	
Gender	Male	228	43	18.6%	.012
	Female	182	22	12.1%	
BMI	<25	371	50	13.6%	.001
	>25	39	14	36.4%	
Additional salt intake	Yes	38	12	30.3%	<.001
	No	372	53	14.2%	
Smoking	Yes	69	34	43.5%	.001
	No	341	30	8.8%	
Drinking alcohol	Yes	235	52	22.2%	<.0001
	No	173	12	6.9%	

Discussion

The prevalence in this study (15.7%) is close to the study of tribal labour population of Gujrat 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. 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[12-14].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 sexes. 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[15,16].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).[17] Joshi R et al found the prevalence of 46.3% among smokers which is similar to our study (43.5%). Gupta A.K et al found that prevalence of hypertension is more among alcoholic (22.8%) in comparison to non- drinkers (7.76%). In this tribal population prevalence of hypertension among alcoholic was 22.2% and the results were statistically significant (x^2 =34.92, df=1, p<.001)[18-20]

Conclusion

A prevalence of 15.7 % indicates that rural areas of our country are also undergoing rapid transition in lifestyle diseases. Although traditional populations around the world were often believed to have low blood pressure, gradually, with changing socioeconomic environment, marked increase in blood pressure has been noted. Tribal populations are more vulnerable as they still live in remote areas with lack of proper health care facility and poor health seeking behaviour. 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.

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