Prevalence And Bio- Social Predictors Of Hypertension In Rural Dehradun

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Abstract: Background and Objectives**:** Cardiovascular diseases account for a large proportion of all deaths and disability worldwide. Hypertension is directly responsible for 57% of all stroke deaths and 24% of all coronary heart disease deaths in India. Studies have shown a high prevalence of hypertension in both urban and rural areas. Although there is generally a lower prevalence of hypertension in rural Indian population, there has been a steady increase over time in this rural population as well. Methodology**:** This observational cross sectional study was conducted in a randomly chosen block in district Dehradun. Overall 457 people were interviewed and measurements were taken to know the prevalence of hypertension and related risk factors. The collected data was entered and analysed in SPSS software (21.0 version). Results**:** The prevalence of hypertension was 23.9% and male subjects had higher prevalence than females (26.2% and 21.5%respectively). With increasing age, prevalence of hypertension increased significantly. Age, sex, marital status, family type and occupation were found as important bio-social predictors of hypertension. Conclusion**:** Increasing prevalence of hypertension in rural areas and in younger age groups is of concern to the public health. In developing countries like India, preventive strategies should be directed towards masses with focus on behaviour change communication. [Juyal R NJIRM 2015; 6(5):1-5]

Key Words: bio-social predictors, hypertension, prevalence, rural.

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Introduction: Hypertension is still largely ignored as a public health problem in most developing countries, though it is a major risk factor for myocardial infarction, stroke, heart failure, renal failure, and peripheral vascular disease[1]. It is directly responsible for 57% of all stroke deaths and 24% of all coronary heart disease deaths in India. An epidemiological shift in the prevalence of hypertension in developing countries as compared to developed countries is being observed[2]. Globally, the overall prevalence of raised blood pressure in adults aged 25 and over was around 40% in 2008[3]. In India, the prevalence of hypertension varies from 10.0% to 30.9%[4]. The average prevalence of hypertension in India is 25% in urban and 10% in rural inhabitants[5]. A recent study by World Health Organization (WHO) has shown a prevalence of hypertension to be 32.5% in India[6].

Evidence shows that the major chronic NCDs including hypertension operate through a cluster of common risk factors, whose presence or absence determines the occurrence and severity of the disease[7].These behavioural risk factors are amenable to modification by simple health promotion and preventive measures and include tobacco and alcohol use, unhealthy diet & physical inactivity[8].

Uttarakhand has been carved out from the state of Uttar Pradesh in the year 2000. Limited studies on hypertension and related risk factors are available from this area. Even at the current state of knowledge, however, the magnitude of the problem is large enough to demand urgent attention and action. Thus an initiative was taken to assess the prevalence of hypertension and associated risk factors in rural and urban areas of district Dehradun. The survey findings of the rural area are being presented in this paper.

Material and Methods: The present study was a community based cross sectional study conducted in selected rural and urban areas of district Dehradun. Based on the prevalence of hypertension (32.5%) from the WHO survey done in 2008(6), the sample size was calculated as 914. For comparison point of view it was decided to take equal number of subjects in both areas; therefore the sample of 914 was equally divided in rural and urban areas i.e. 457 subjects in each area.

Multistage stratified random sampling method was employed to get the desired sample size. In

Dehradun district, there are 6 blocks in the rural area. First of all, 10% of the blocks i.e. one block (Doiwala) was sampled by simple random sampling. This block caters to the population of approx. 2.5 lacs and comprises of five Nyaypanchayats. So, in the next stage, 10% of the Nyay-panchayats i.e. one Nyaypanchayat (Markham Grant) was sampled randomly. Markham Grant consists of 19 villages, of which (10%) i.e. 2 villages were randomly selected to achieve the required sample population i.e. 457. In the selected villages, study houses were selected by systematic random sampling.

Keeping in view that prevalence of hypertension and its risk factors are increasing even in younger age groups, individuals aged 20-60 years were included in the study, who were residents of the area for at least one year and willing to give consent. People with mental illness, physical or developmental disabilities and pregnant and lactating women were not included in this study.

For collecting data, a pre structured and pretested questionnaire from WHO STEPS Instrument for NCD risk factor surveillance[9] was adopted and modified to suit local requirement. In the selected household, each present member was interviewed after taking written informed consent and his/her blood pressure was measured following standard protocol. Other measurements like height, weight, waist circumference etc. were also noted. While taking measurements of female respondents, the presence of a female health worker or family member was ensured. If the selected house was found to be locked or eligible individual was absent, it was revisited twice and if the person was again absent, he/she was excluded from the study. If no subject was found in the selected household, next house was selected. The collected data was compiled, tabulated and analysed by using SPSS 20.0 version, and Microsoft excel 2007. Percentages were calculated for all the variables, Chi square test was applied for categorical variables.

Criteria for Hypertension:
Normal BP: <120/<80
Pre hypertension: 120–139/80–89
Hypertension, Stage 1: ≥140–159/ ≥90–99
Hypertension, Stage 2: ≥160/≥100

Results:

Table 1: Age –Sex distribution of study subjects:

Age Groups	Male (229)	Female (228)	Total (457)
20-29 yrs	78 (34.1)	114 (50.0)	192 (42.0)
30-39 yrs	82 (35.8)	45 (19.7)	127 (27.8)
40-49 yrs	31 (13.5)	27 (11.8)	58 (12.7)
50-60 yrs	38 (16.6)	42 (18.4)	80 (17.5)

(Figures in parentheses are percentages)

The subjects were distributed in four groups according to the age; 20-29, 30-39, 40-49 and 50-60 years. Majority of respondents belonged to the age group of 20-29 years (42.0%). Most of the men belonged to 30-39 years age group (35.8%), while maximum females (50.0 %) belonged to 20-29 years age group. The mean age of the surveyed population was 36.21±12.3 years (males-37.17 ±11.6 years, females-35.25±12.4 years).

Table 2 : Age wise distribution of Blood Pressure:

Age group	No. of subjects	Pre HT*	HT*
20-29 years	192	170 (88.54)	1 (0.52)
30-39 years	127	106 (83.46)	13 (10.23)
40-49 years	58	27 (46.55)	30 (51.72)
50-60 years	80	13 (16.25)	65 (81.25)
Total	457	316 (69.1)	109 (23.9)

*HT- Hypertension
(Figures in parentheses are percentages)

The prevalence of hypertension (cumulative stage I and II) was found to be 23.9%. It consistently increased with the increasing age with maximum being in the age group of 50-60 years, while the prevalence of pre-hypertension decreased with increasing age. This trend was found to be highly significant statistically (χ^2 - 242.909, p- 0.0001).

Table 3 : Sex wise distribution of Blood Pressure:

BP (mmHg)	M (229)	F(228)	Total
<120& <80	13 (5.7)	19 (8.3)	32 (7.0)
<120-139 / 80-89	156 (68.1)	160 (70.2)	316 (69.1)
≥140/90	60 (26.2)	49 (21.5)	109 (23.9)

(Figures in parentheses are percentages)

The prevalence of hypertension was more among males (26.2%) as compared to females (21.5%) but this difference was not significant statistically (χ^2-2.28;p->0.05).

Overall, pre-hypertension was more in females as compared to males (70.2 % and 68.1 % respectively). In males, the prevalence of pre-hypertension and hypertension was overall same as females, but in the age group 50-60 years, females were having significantly more hypertension than males (81.5% and 74.0% respectively).

Table 4: Association of Blood Pressure with Socio-demographic Variables

BP category	Non- HT* (348)	HT* (109)
Marital status		
Unmarried	65 (98.5)	1 (1.5)
Married	277 (73.3)	101 (26.7)
Widowed/separated/ Divorced	6 (46.2)	7 (53.8)
Chi-square value	26.28, df-2, p<0.0001	
Occupational status		
Govt/ private job	17 (89.5)	2 (10.5)
Farmer/labourer	53 (85.5)	9 (14.5)
Student	29 (100.0)	0 (0.0)
Business	72 (79.1)	19 (20.9)
Household work	166 (77.6)	48 (22.4)
Retired / unemployed	11 (26.2)	31 (73.8)
Chi-square value	72.3, df-5, p<0.0001	
Socio-economic status		
Upper	10 (71.4)	4 (28.6)
Upper middle	9 (60.0)	6 (40.0)
lower middle	36 (76.6)	11 (23.4)
upper lower	118 (75.6)	38 (24.4)
Lower	175 (77.8)	50 (22.2)
Chi-square value	2.68, df-4, p>0.05	
Family Type		
Joint	242 (79.1)	64 (20.9)
Nuclear	106 (70.2)	45 (29.8)
Chi-square value	4.39, df-1, p<0.05	

*HT- Hypertension
(Figures in parentheses are percentages)

It is clear from the table- 4 that hypertension was maximally found in those who were widowed/ separated or divorced (53.8%), followed by married respondents (26.7%). This difference was found to be highly significant. (p< 0.0001).
Hypertension was maximum in respondents who were retired or unemployed (73.8%) followed by housewives/ household workers (22.4%) and persons in small business (20.9%). It was least in the persons in jobs (10.5%) and none of the students had hypertension. This trend was found to be highly significant.

Hypertension was maximally seen in the upper-middle socio-economic strata (40.0%) and least in respondents belonging to the lower SES (22.2%), but on comparison, no significant difference was seen. People living in nuclear families were more hypertensive (29.8%) than those in joint families (20.9%) and this difference was significant statistically.

Results and Discussion: Hypertension is estimated to cause 4.5% of current global disease burden and is as prevalent in many developing countries, as in developed world. Present study included subjects who were between 20-60 years of age, because of the increasing prevalence of risk factors in younger age groups and also due to the fact that behavioural modifications are best effective at a younger age. Todkar et al[10] in their study selected participants aged 19 years and above to find out the prevalence and socio demographic factors of hypertension in rural Maharashtra. ICMR conducted a survey on surveillance of risk factors for non communicable diseases in seven states among individuals who were 15-64 years in the year 2008[11].

The overall prevalence of hypertension in rural area in the present study was 23.9%. There has been gradual increase in prevalence of hypertension with time in rural area. Factors which are attributable to these changes in rural area are probably lifestyle and dietary changes and increased life expectancy. Similar observation of 20.8% prevalence was reported in a study conducted by Singh RB et al in a rural population comprising of two randomly selected villages in the Moradabad district in North India[12].

In our study, there was an increase in overall prevalence of hypertension (cumulative stage 1 and II) with increasing age and was reported to be

4.3 % in 20- 39 years & 51.7 % and 81.3% in 40-49 years and 50-60 years respectively. These findings were similar to IDSP survey Uttarakhand, reporting increasing prevalence of hypertension as 9.9% in 15-24 years, 33.2% in 45-54 years and 42.6% in 55-64 years[11]. Such changes of blood pressure with age might be due to changes in vascular system i.e. atherosclerotic changes in blood vessels. Survey in a rural area of Chandigarh revealed a prevalence of 0.8% in < 40 years age, 8.65% between 41-50 years age and 12.8% in the age group > 50 years[13]. Todkar SS et al, in a study at rural Maharashtra reported that prevalence of hypertension increased significantly with increasing age[10]. Another study by Vedapriya DR also showed that the risk of hypertension was significantly associated with increase in age[14]. The prevalence of hypertension increased significantly with increasing age in a survey in Agra[15].

We found the prevalence of hypertension to be more among males as compared to females (26.2% and 21.5% respectively), but in the age group 50-60 years, females were having significantly more hypertension than males (81.5% and 74.0% respectively). Deshmukh PR also observed the prevalence of hypertension to be slightly higher (21.8%) in men as compared to 19.8% in women[16]. Gupta from Jaipur, through three serial epidemiological studies (Criteria: ≥140/90 mm of Hg) carried out during 1994, 2001, and 2003 demonstrated rising prevalence of hypertension (30%, 36%, and 51%, respectively, among males and 34%, 38%, and 51% among females) [17].

In a study in Bihar[18], prevalence of hypertension among males (13.09%) was found to be more than females (9.57%). Joshi et al[19] observed in a study in Mumbai that there was an increasing trend of hypertension as age advances and even in post menopausal women, as the prevalence rate rose from 4% among young to 17.2% in 60 years of age group.

In our study prevalence of hypertension was seen more in nuclear families (27.5%) in comparison to joint families (19.2%). In nuclear families anxiety, restlessness and stress are more prevalent and these factors may be attributed to cause hypertension in study subjects. There is also lack of care and social support in small families leading to more stressful life. Similar observation was seen by Momin et al[20] in their study, where prevalence of hypertension was significantly higher among nuclear type of family (35.5%) as compared to the joint type of family (25.8%).

The prevalence of hypertension was significantly more among single persons who were living their life without their partner like separated/ divorced / widow/widower (53.8%). Similar findings were reported by Momin et al[20].

Few studies in India[13, 21] have shown a higher prevalence of hypertension in the higher socio-economic groups, but in our study, socio- economic status was not found to be significantly associated with hypertension. Maximum prevalence (40.0%) of hypertension was seen in upper-middle socio-economic group and least (22.2%) was observed in lower class. A very large community based study in Mumbai[22] also found no such difference between high and low socio-economic groups.

Conclusion: WHO reports that hypertension is an important public health problem not only in developed countries but also in developing countries. The trend is changing and rural areas are also showing increase in number of hypertensives. This has been attributed to rapid urbanization, changing lifestyle and dietary pattern. Prevalence of hypertension in the present study supports the increasing trend of hypertension in the rural communities of India. Increase in age, gender, occupation and type of family were found to be associated with hypertension. There is an urgent need to strengthen existing public health measures to address growing trends of CVD risk factors in communities through health education about weight reduction, restriction of tobacco smoking and chewing, increase in physical activity, salt restriction, proper screening of BP, blood sugar and serum cholesterol levels, as well as increase in the intake of fruits and vegetables.

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Conflict of interest: None

Funding: None

Cite this Article as: Singh S, Srivastava A, Juyal R, Semwal J, Deep Shikha, Vyas S. Prevalence and bio- social predictors of hypertension in rural Dehradun. Natl J Integr Res Med 2015; 6(5): 1-5.