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Prevalence & Correlates of Hypertension in a Rural Area of Haryana

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Abstract
Background: *Hypertension accounts for 75% of chronic Non-Communicable Diseases (NCDs). Raised blood pressure is estimated to cause 7.5 million deaths, which is a major risk factor for cardiovascular disease.*
Aims & objectives: *To determine the prevalence & correlates of hypertension among the rural community of block Beri, district Jhajjar, Haryana.*
Methods: *This cross-sectional study was carried out during the period of September 2012 to August 2013. Multistage random sampling was used in this study. 1080 individuals of 15-64 years age group who were further subdivided into five subgroups (15-24, 25-34, 35-44, 45-54 and 55-64 years)taking 90 individuals from each anganwadi area were selected and interviewed. Appropriate statistical tests were used for analysis.*
Results: *In our study the prevalence of hypertensionwas found to be 22.9% hypertension (M:27.6%; F:18.1%).*
Conclusion: *Our study confirmed the high burden of hypertension in rural areas and reiterated the need to address these issues comprehensively as a part of NCD prevention and control strategy.*
Keywords: *Hypertension, NCD, Rural*

Introduction

What exactly are Non Communicable Diseases (NCDs)? NCDs are defined as a group of diseases having non-infectious origin, long duration, generally slow progression and are the major cause of adult mortality and morbidity worldwide.[1] Four main diseases are generally considered to be dominant in NCD's mortality and morbidity: cardiovascular diseases (including heart disease and stroke), diabetes, cancers and chronic respiratory diseases (including chronic obstructive pulmonary disease and asthma).

Cardiovascular disease (CVD) refers to a group of diseases involving the heart, blood vessels, or the sequelae of poor blood supply due to a diseased vascular system. Over 82% of the mortality burden is caused by ischaemic or coronary heart disease (IHD), stroke (both hemorrhagic and ischaemic), hypertensive heart disease or congestive heart failure (CHF). Over the past decade, CVD has become the single largest cause of death worldwide, representing nearly 30% of all deaths and about 50% of NCD deaths.[1] In 2008, CVDs caused an estimated 17 million death

and led to 151 million Disability adjusted life years (DALYs) (representing 10% of all DALYs in that year). Behavioural risk factors such as physical inactivity, tobacco use and unhealthy diet explain nearly 80% of the CVD burden.[2]

In terms of number of deaths, 26 million (nearly 80%) of the 36 million of global NCD deaths in 2011 occurred in low- and middle-income countries. In terms of proportion of deaths that were due to NCDs, high-income countries had the highest proportion – 87% of all deaths which were caused by NCDs – followed by upper-middle income countries (81%). The proportions were lower in low-income countries (36%) and lower-middle income countries (56%).[3]

The leading causes of NCD deaths globally in 2008 were cardiovascular diseases (17 million deaths, or 48% of all NCD deaths), cancers (7.6 million, or 21% of all NCD deaths), and diabetes caused another 1.3 million deaths.6 Nearly 70% of the non-communicable diseases are contributed by CVD, cancer, and diabetes taken together.

Raised blood pressure is estimated to cause 7.5 million deaths, which is a major risk factor for cardiovascular disease. At least 2.8 million people die each year as a result of being overweight or obese. Risk of heart disease, stroke, certain cancer and diabetes increase steadily with increasing body mass index (BMI). [4]

The NCDs are the today's major public health concern in our country contributing to high morbidity and mortality as has been highlighted in the preceding pages. This group of diseases can be largely reduced solely by primordial and primary prevention. It was the need of the hour to assess the magnitude of risk factors of NCDs in rural areas of Haryana

Materials and Methods
Study area and study period
This cross-sectional study was carried out during the period of September 2012 to August 2013 in Block Beri, district Jhajjar, Haryana, a rural field practice area of Department of Community Medicine, PGIMS, Rohtak. This block is served by one General hospital (Beri), two Community Health Centres (Dighal and Dubhaldan), five Primary Health Centres and twenty five Subcentres and has a total of 136 Anganwadi Centres (AWCs). Ethical approval to conduct the study was taken from Institution Review Board (IRB). Active support and help of health workers and anganwadi workers was taken in contacting and motivating study population which made them more cooperative and the non-responders were minimized.

Sample Size and Sampling Strategy
Sample size was calculated to be 970 considering the prevalence of hypertension as 15%[5]with confidence level of 95% and 15% allowable error. Multistage random sampling was used by including both the CHC's and three randomly selected PHCs of the rural block. From each PHC, two subcentres were randomly selected and from each subcentre area, two anganwadis were also selected by simple random sampling technique. Hence a total of 6 sub-health centres and 12 anganwadis were included in the study. From each anganwadi, 90 individuals of 15-64 years age group who were further subdivided into 15-24, 25-34, 35-44, 45-54 and 55-64 years age-group were selected and interviewed. Gender wise enumeration of the study population according to the subdivided age groups was done from the anganwadi registers. Nine males and nine females were selected from each of the five age subgroups by systematic random sampling. Thus, a sample size of 1080 was included in the study. In case, the desired numbers of study subjects were not available in any anganwadi area, subsequent anganwadi population was included in the study. Those subjects who were not willing to participate and could not be contacted were excluded and next individual was selected for the interview instead.

Data collection and Analysis
A pre-tested, semi-structured schedule was used for interviewing the study subjects. Written and informed consent was taken from all the subjects

before initiating the interview. The confidentiality of the information was assured.

Collected data were entered in the Excel spreadsheet and analysis was carried out using Statistical Package for Social Studies (SPSS) version 20.0. Pearson's chi square test and fisher exact test were used to evaluate differences between groups for categorized variables. Normally distributed data were presented as means and standard deviation, or 95% confidence intervals (CI) . Student's t test and logistic regression analysis was done to evaluate factors associated with tobacco intake. All tests were performed at a 5% level of significance, thus an association was significant if the p value was < 0.05.

Observations

The present study was undertaken in block Beri, district Jhajjar, Haryana which is located at 28º latitude & 76º longitudes. The block headquarter is situated 28 kms from Rohtak, 75 kms from Delhi and 8 kms from Jhajjar (District Headquater) and is a rural field practice area attached to Department of Community Medicine, Pt. B. D. Sharma PGIMS, Rohtak for the purpose of teaching, training and research activities for medical undergraduates and postgraduates students.

Table 1: Prevalence of Hypertension among study subjects by age groups & gender.

Age group (years)	Hypertension		
	Male (n=540)	Female (n=540)	Total (N=1080)
15-24	7/108 (6.5)	6/108 (5.6)	13/216 (6.0)
25-34	31/108 (28.7)	10/108 (9.3)	41/216 (19.0)
35-44	31/108 (28.7)	24/108 (22.2)	55/216 (25.5)
45-54	38/108 (35.2)	27/108 (25.0)	65/216 (30.1)
55-64	42/108 (38.9)	31/108 (28.7)	73/216 (33.8)
Total	149/540 (27.6)	98/540 (18.1)	247/1080 (22.9)
χ^2	34.2	30.0	58.5
p value	0.000	0.000	0.000

(Figures in parentheses indicate percentages)

This table revealed that the overall prevalence of hypertension, having systolic blood pressure ≥140 mmHg and/or diastolic blood pressure ≥90 mmHg to be 22.9% (247/1080) and it was higher among males (27.6%) as compared to females (18.1%). There was an increase in prevalence with age, in both males and females. Among males, it increased from 6.5% in 15-24 years age group to 38.9% in 55-64 years age group. The similar trend was observed among females, where prevalence of hypertension increased from 5.6% in 15-24 years to 28.7% in 55-64 years age group. This difference in age groups was found to be statistically significant among both males (p=0.000) and females (p=0.000). One can imagine the future load of NCDs where the prevalence of hypertension was nearly two-fifths (38.9%) in males in the age group of 55-64 years and 28.7% in females in the same age group, which points to towards an urgent concern to rising trend of NCDs in rural areas of Haryana.

Table 2: Association of socio-demographic variables with Hypertension

Socio-demographic Variables	Hypertensive (n=247)	Non-hypertensive (n=833)	Total (N=1080)	Significance χ^2, p value
Marital status				
Married	212 (24.0)	672 (76.0)	884 (100.0)	10.292, 0.016
Unmarried	22 (14.1)	134 (85.9)	156 (100.0)	
Divorced	2 (50.0)	2 (50.0)	4 (100.0)	
Widowed	11 (30.6)	25 (69.4)	36 (100.0)	
Educational status				
Illiterate	75 (23.1)	250 (76.9)	325 (100.0)	10.898, 0.028
Primary	26 (28.9)	64 (71.1)	90 (100.0)	
Middle	27 (15.6)	146 (84.4)	173 (100.0)	
High school	80 (22.1)	282 (77.9)	362 (100.0)	
Graduate and above	39 (30.0)	91 (70.0)	130 (100.0)	
Occupation				
None	88 (18.5)	387 (81.5)	475 (100.0)	40.324, 0.000
Labourer	46 (21.4)	169 (78.6)	215 (100.0)	
Caste occupation	0 (0.0)	13 (100.0)	13 (100.0)	
Business	16 (53.3)	14 (46.7)	30 (100.0)	
Independent	25 (30.1)	58 (69.9)	83 (100.0)	
Cultivation	22 (18.3)	98 (81.7)	120 (100.0)	
Service	50 (34.7)	94 (65.3)	144 (100.0)	
Socio-economic status				
Lower	20 (13.4)	129 (86.6)	149 (100.0)	30.713, 0.000
Lower-middle	88 (18.4)	389 (81.6)	477 (100.0)	
Middle	106 (29.1)	258 (70.9)	364 (100.0)	
Upper-middle	27 (36.0)	48 (64.0)	75 (100.0)	
Upper	6 (40.0)	9 (60.0)	15 (100.0)	

(Figures in parentheses indicate percentages)

Above table showed the prevalence of hypertension as highest among divorced (50.0%) followed by widowed (30.6%), married (24.0%) and unmarried (14.1%). Association with educational status, it was observed to be higher in graduate and above category (30.0%) than illiterate (23.1%). Association of hypertensive with participants belonging to business category (53.3%) was higher than those who had no occupation (18.5%). The prevalence of hypertension was highest among upper (40.0%) followed by upper-middle (36.0%) middle (29.1%), lower-middle (18.4%) and lower socio-economic status (13.4%). The difference observed by marital status (p=0.016), educational status (p=0.028), occupation (p=0.000) and socio-economic status (p=0.000) with prevalence of hypertension was statistically significant.

Table 3: Comparison of various quantitative variables with Hypertension (N= 1080).

Variables	Hypertensive (N=247)	Non Hypertensive (N=833)	p value
Weight (kgs)	68.22 ± 13.08	56.53 ± 11.91	0.000
Height (cms)	162.88 ± 9.17	159.71 ± 9.41	0.000
BMI (kg/m^2)	25.92 ±5.68	22.13 ± 4.14	0.000
SBP (mmHg)	143.09 ± 16.74	113.61 ±10.84	0.000
DBP mmHg)	92.74 ±11.22	74.72 ±7.63	0.000
WC (cms)	94.44± 12.67	83.21±11.30	0.000
Age (years)	45.27 ± 12.88	37.63± 14.45	0.000

Table 3 observed that all quantitative variables i.e. Weight (68.22 ± 13.08 vs 56.53 ± 11.91 kgs, p=0.000), BMI (25.92 ± 5.68 vs 22.13 ± 4.14 kg/m^2, p=0.000), Age (45.27 ± 12.88 vs 37.63 ± 14.45 years, p=0.000), WC (94.44 ± 12.67 vs 83.21 ± 11.30 cms, p=0.000) were significantly associated with hypertensives as compared to non-hypertensives.

Prevalence of NCD risk factors – Hypertension

In our study, the overall prevalence of hypertension was found to be 22.9%. Other studies conducted by Subburam et al (2009, Tamilnadu), Thankappanet al (2010, Kerela), and Bodhare et al (2013, Andhra Pradesh) revealed prevalence of hypertension as 33%, 32.5% and 38.5% respectively, which was comparatively higher than our study.[6, 7, 8]Other studies conducted by Chow et al (2007), Saxena et al (2011) and Kokiwar et al (2012) reported the prevalence of hypertension as 20.3%, 6.7% and 19% respectively, which was comparatively lower than our study.[9, 10, 11] These differences might be because of the environmental conditions focusing around the socioeconomic status, dietary practices, cultural pattern, physical activities and high tobacco and alcohol consumption.

The prevalence of hypertension was higher among males (27.6%) as compared to females (18.1%) in our study. Similarly, other studies conducted by Krishnan et al (2008), Thankappanet al (2010) and Saxena et al(2011) also reported that the prevalence of hypertension was higher among males (10.7%, 34.4% and 8.2%) than females (7.9%, 30.8% and 5.5%) respectively in the above mentioned studies.[12, 13, 10] IDSP NCD risk factor survey reported among the rural households, hypertension varied from 16% in Tamil Nadu to 22% in Maharashtra.[14]

Socio-demographic variables with hypertension

Our study reported prevalence of hypertension was higher in graduate and above category (30.0%) than illiterate (23.1%).Business class (53.3%) had highest prevalence in the occupation group.In contrast to our study, IDSP reported overall pattern of prevalence of hypertension was decreasing with increasing levels of education in the surveyed states.[14]

The prevalence of hypertension was highest among upper (40.0%) followed by upper-middle (36.0%) middle (29.1%), lower-middle (18.4%) and lower socio-economic status (13.4%) in our study because of the more prevalence of associated risk factors as explained above. Kinra et al (2010) reportedthat theprevalence of hypertension was more in high socioeconomic group (Males: 20.8%; Females: 25.3%) than as compared to middle (Males: 17.1%; Females: 20.5%) and low socioeconomic group (Males: 20.8%; Females: 25.3%) which was comparable with the present study.[15]

Limitations of the study

- This was a cross-sectional study. The study subjects were not followed up after a single visit. There is still a possibility that the subjects may have developed NCD risk factors in coming months.
- The study area is in close proximity to National Capital Region (NCR) of Delhi. Therefore people of these villages enjoy most of urban amenities. They prefer sedentary jobs instead of agriculture based field works. Because of economic prosperity of these villages, they may not be representative of the state or country.

Recommendations

- It needs to re-emphasize and sensitize the peripheral health workforce i.e. right from ASHA to Medical officers regarding risk factors for NCDs. In peripheral health institutions the logistics required for NCDs (BP apparatus, inch tape, height measuring scale, weighing machine) are either not present or are not in a working condition. These essential logistics must be in order for appropriate and routine screening of these deadly NCDs.

- Timely assessment of the realistic situation of NCDs and the associated risk factors is the need of the hour for planning & implementation of the National Programme for Prevention and Control of Cancer, Diabetes, Cardiovascular diseases & Stroke (NPCDCS) which has neither been taken up at the level of health institutions and nor it figures among the priority health programs. It needs special attention as this program could serve as the mainstay in the field of prevention & control of NCDs.   On the part of government the efforts for BCC are not sufficient to create awareness among masses and to facilitate early identification of NCDs for early intervention measures.

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