



BURDEN AND ASSOCIATES OF HYPERTENSION IN RURAL VARANASI: A CROSS SECTIONAL STUDY

Community Medicine

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ABSTRACT

Background: Hypertension is a globally important public health issue. It is a risk factor for various diseases like cardiovascular diseases, stroke, kidney failure and many other premature mortality and disability. **Objectives:** To estimate the burden of hypertension and associated risk factors among the study subjects. **Method:** A community based cross sectional study design was adopted. Total 327 subjects of age 30 years and above were included in the study, probability proportion to population size and simple random sampling was used for collection of data after getting informed consent in Chiragaon block of Varanasi. **Results:** Overall prevalence of hypertension was 32.4 % in our study. About 75% subjects were newly diagnosed hypertensive. **Conclusion:** High burden of undiagnosed hypertensive is present in rural area which needs to be addressed with large scale community based study.

KEYWORDS

Hypertension, Burden, Risk Factors

INTRODUCTION

Hypertension is a globally important public health issue. It is a risk factor for various diseases like cardiovascular diseases, stroke, kidney failure and many other premature mortality and disability. In the majority of cases, hypertension in the early stage is symptomless and thus remains undiagnosed in many people and diagnosed people may not have access to treatment and people may not be able to control their illness successfully.

According to WHO report 2018, Non Communicable Disease (NCD) burden remains high globally. In 2016, out of world's 57 million deaths, NCDs were responsible for 41 million deaths (71%), among these 15 million were premature deaths (30 to 70 years). Burden is high in low and middle income countries, where 78% of all NCDs deaths and 85% of premature deaths occurred due to hypertension. According to WHO projections, the total annual number of deaths from NCDs will increase to 55 million by 2030, if timely interventions are not done for and control of hypertension.¹

In Indian, nearly 5.8 million people (WHO report, 2015) die from NCDs every year or 1 in 4 Indians has a risk of dying from an NCD before they reach the age of 70.²

Risk factors are cumulative and operate on a life course perspective. It is important to note that all these risk factors are amenable to modification through lifestyle changes. Thus primordial, primary and secondary prevention of chronic diseases and their common risk factors provide the most sustainable and cost-effective approach to chronic disease prevention and control.

METHODOLOGY

The study was conducted in Chiragaon Community Development Block of Varanasi district of Uttar Pradesh. Study was approved by Ethical Committee of Institute of Medical Science, BHU. Study was conducted from a period of November 2017 to March 2019. It was a community based cross sectional study and people who completed 30 years of age and above were taken as study subjects including both male and female who were willing to participate in study and gave written consent. People whose age was below 30 years, severely sick and pregnant females were excluded from study.

Sample Size was calculated on the basis of the prevalence of hypertension 15.2% which comes to be 327. Out of 139 villages of Chiragaon block 4 village of our service area were selected and probability proportional to size was done at village level. The tools used in this study were pre designed pretested interview schedules used to record the information, Omoron digital (model number HEM 7124) BP apparatus, portable weighing machine, stadiometer and non-stretchable measuring tape.

Study subjects were interviewed regarding socio-demographic characteristics, personal attributes, family history, any associated

illness using a pre designed and pre tested interview schedule. Uday Pareek Scale was used for socio-economic status categorization. JNC VIII Classification of blood pressure was used for hypertension categorization. Asian cutoff was taken for BMI and Waist Hip ratio. The data thus collected was coded and entered in Microsoft office excel worksheet and imported to SPSS software version 23 was used for statistical analysis. For association chi square test was applied.

RESULT

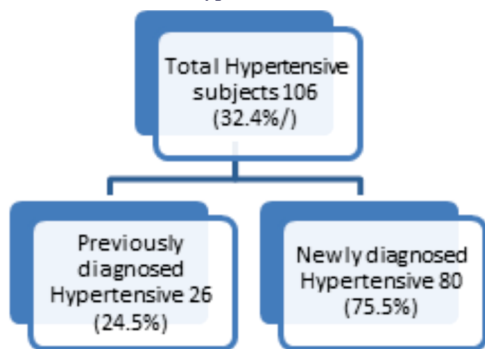
Table 1 shows socio-demographic profile of study subjects. More than half (57.5%) of the study subjects were female. Two third families were joint and about 50% families had 6 to 10 members. 80 % were married, 60% illiterate and 40% unemployed. 47.9% belong to lower middle class socioeconomic strata.

Table no 1: Socio-demographic profile

Sociodemographic Variables	Variable group	N	%
Religion	Hindu	324	99.1
	Muslim	3	0.9
Caste	ST/SC	118	36.1
	OBC	178	54.4
	OTHERS	31	9.5
Gender	Male	139	42.5
	Female	188	57.5
Age Group (years)	30-39	63	19.3
	40-49	71	21.7
	50-59	84	25.7
	60-69	74	22.6
	70 and above	35	10.7
Mean age ±SD	Male	55.2±13.3	
	Female	49.2± 11.5	
Type of Family	Nuclear	112	34.3
	Joint	215	65.7
Total number of Family members	≤5	120	36.7
	6-10	157	48
	>10	50	15.3
Marital Status	Married	275	84.1
	Unmarried/Widowed /Widower	52	15.9
Education	Illiterate	196	59.9
	Primary and Middle	87	26.6
	High School and Intermediate	23	7
	Graduate and above	21	6.4
Occupation	Unemployed	153	46.8
	Housewife	92	28.1
	Labour (skilled/unskilled)	33	10.1

Socioeconomic Status	Farming	28	8.6
	Business/service (private/government)	21	6.4
	Upper Class	2	0.6
	Upper Middle Class	38	11.6
	Middle Class	78	23.9
	Lower Middle Class	156	47.9
	Lower Class	52	15.9
Total		327	100

Figure no 1: Prevalence of Hypertension



According to figure no 1, overall prevalence of hypertension was 32.4 % in our study. About 75% subjects were newly diagnosed hypertensive during the study period.

As shown in table no 2, prevalence of hypertension increased

Table no 2: Non Modifiable risk factor of Hypertension

Age group (Years)	Blood Pressure			Total N (%)	X ² =46.63 df=8 P= .00
	Normal N (%)	Pre –hypertension N (%)	Hypertension N (%)		
30-39	22(34.9)	34(54)	7(11.1)	63 (100)	
40-49	15(21.1)	43(60.6)	13(18.3)	71(100)	
50-59	11(13.1)	42 (50.0)	31 (36.9)	84 (100)	
60-69	10 (13.5)	31(41.9)	33 (44.6)	74(100)	
≥70	3 (8.6)	10 (28.6)	22 (62.8)	35 (100)	
Total	61(18.7)	160 (48.9)	106(32.4)	327 (100)	
Gender					
Male	22 (15.8)	64 (46.0)	53(38.2)	139 (100)	X ² =3.882 df=2 P=0.144
Female	39 (20.7)	96 (51.1)	53(28.2)	188(100)	
Total	61(18.7)	160(48.9)	106 (32.4)	327(100)	
Caste					
SC/ST	25 (21.2)	63 (53.4)	30 (25.4)	118 (100)	X ² =15.859 df=4 P=0.003
OBC	35 (19.7)	86 (48.3)	57 (32)	178 (100)	
Others	1 (3.2)	11 (35.5)	19 (61.3)	31 (100)	
Total	61 (18.7)	160 (48.9)	106 (32.4)	327 (100)	
Family Type					
Nuclear Family	22 (19.6)	62(55.4)	28 (25)	112(100)	X ² =4.417 df=2 P=0.110
Joint Family	39(18.2)	98(45.6)	78 (36.2)	215(100)	
Total	61 (18.7)	160 (48.9)	106 (32.4)	327 (100)	
Education					
Illiterate	42 (21.4)	93 (47.4)	61 (31.2)	196 (100)	X ² =3.467 df=6 P=0.748
Primary and Middle	14 (16.1)	45 (51.7)	28 (32.2)	87 (100)	
High school and Intermediate	2 (8.7)	12 (52.2)	9 (39.1)	23 (100)	
Graduate and above	3 (14.3)	10 (47.6)	8 (38.1)	21 (100)	
Total	61 (18.7)	160 (48.9)	106 (32.4)	327 (100)	
Occupation					
Unemployed	25 (16.3)	71 (46.4)	57 (37.3)	153 (100)	X ² = 10.830 df=8 P=0.212
Housewife	15 (16.3)	51 (55.4)	26 (28.3)	92 (100)	
Labour	5 (15.2)	18 (54.5)	10 (30.3)	33 (100)	
Cultivation	8 (28.6)	12 (42.8)	8 (28.6)	28 (100)	
Service/Business	8 (38.1)	8 (38.1)	5 (23.8)	21 (100)	
Total	61 (18.7)	160 (48.9)	106 (32.4)	327 (100)	
Socioeconomic class					
Upper Class	0 (0)	1 (50)	1 (50)	2 (100)	X ² =19.328 df=8 P= 0.013
Upper Middle Class	4 (10.6)	11 (28.9)	23 (60.5)	38 (100)	
Middle Class	14 (17.9)	36 (46.2)	28 (35.9)	78 (100)	
Lower Middle Class	34 (21.7)	83 (52.8)	40 (25.5)	157 (100)	
Lower Class	9 (17.3)	29 (55.8)	14 (26.9)	52 (100)	
Total	61 (18.7)	160 (48.9)	106 (32.4)	327(100)	

significantly (p<0.05) with advancing age. Hypertension was equally (50%) distributed among both genders. Pre-hypertension was more (60%) common among females than male. 25.4% SC/ST subjects were hypertensive and 53.4% were pre-hypertensive. More than half (53.7%) of hypertensive subjects belong to OBC category. Among the subjects of OBC category, 48.3% were in pre-hypertensive group. There was significant (p<0.05) association found between caste and blood pressure of study subjects. Out of 106 hypertensive subjects 73.5% were belonged to joint family and rest 26.4% were belonged to nuclear family.

Two third of illiterate subjects belong to pre-hypertensive and hypertensive groups. Among the unemployed group only 16.3% subjects were normotensive and the rest 83.7 % were pre-hypertensive and hypertensive. In the labour and housewife group more than half subjects were pre-hypertensive. Out of 38 upper middle class subjects 60.5 % were hypertensive while the middle class, lower middle class and lower class subjects, 46.20 %, 52.8% and 55.8 % were in pre-hypertensive respectively. There was significant (p< 0.05) association between socioeconomic class and prevalence of hypertension.

Table 3 shows, more than 80% obese subjects (as per BMI) belonged to pre-hypertensive and hypertensive category. According to waist hip ratio more than 2/3 obese belonged to prehypertensive and hypertensive group. Out of 327 study subjects 80% had daily salt intake of ≥ 5gm/day and half of these 80% were pre-hypertensive. Out of 106 hypertensive subjects more than 80% had daily intake of salt more than or equals to 5gm/day. Addiction was present in 81.3% of pre-hypertensive and hypertensive subjects.

Out of 327 subjects most of them (65.7%) were physically inactive and rest (34.2%) were physically active. Out of 106 hypertensive more than half (58.5%) were physically inactive rest (41.5%) were physically active.(table 2)

Table 3 Modifiable Risk factors of Hypertension

BMI	Blood Pressure			Total N (%)	X ² = 9.902 df=6 P=0.129
	Normal N (%)	Pre-hypertension N (%)	Hypertension N (%)		
Underweight	7 (28)	12 (48)	6 (24)	25 (100)	
Normal	29 (25.2)	54 (47)	32 (27.8)	115 (100)	
Overweight	13 (16.2)	40 (50)	27 (33.8)	80 (100)	
Obese	12 (11.2)	54 (50.5)	41 (36.3)	107 (100)	
Total	61 (18.7)	160 (48.9)	106 (32.4)	327 (100)	
Waist Hip ratio of study subjects					
Normal	21 (22.8)	46 (50)	25 (27.2)	92 (100)	X ² = 2.309 df=2 P=0.315
Obese	40 (17)	114 (48.5)	81 (34.5)	235 (100)	
Total	61 (18.7)	160 (48.9)	106 (32.4)	327 (100)	
Salt intake per day(gm/day)					
<5gm/day	11 (25)	18 (40.9)	15 (34.1)	44 (100)	X ² =1.810 df=2 P=0.405
≥5gm/day	50 (17.7)	142 (50.1)	91 (32.2)	283 (100)	
Total	61 (18.7)	160 (48.9)	106 (32.4)	327 (100)	
Addiction					
Present	29 (18.7)	75 (48.4)	51 (32.9)	155 (100)	X ² =.040 df=2 P=0.98
Absent	32 (18.6)	85 (49.5)	55 (31.9)	172 (100)	
Total	61 (18.7)	160 (48.9)	106 (32.4)	327 (100)	
Physical Activity					
Inactive	47 (21.9)	106 (49.3)	62 (28.8)	215 (100)	X ² =5.957 df=2 P=.051
Active	14 (12.5)	54 (48.2)	44 (39.3)	112 (100)	
Total	61 (18.7)	160 (48.9)	106 (32.4)	327 (100)	

DISCUSSION

Overall prevalence of hypertension in present study in age more than 30 years was 32.4% (table 2). Slightly higher prevalence 38.9% was found in a study conducted by Prabhakumari et al. (2016) in central Kerala³. Hari Shankar et al. (2019) conducted a study in the rural area of Varanasi in the age group 40 years and above and reported prevalence of hypertension was 29%⁴. Prashant R Kokiwar et al. (2012) conducted a study in the central part of India and found that the overall prevalence of hypertension was 19.04% which is lower than the present study, as in the last decade the prevalence of hypertension increased so this difference was found⁵.

As age advances the prevalence of hypertension increases (table 2). Similar results reported by Vani Srinivas et al. (2019) who conducted study in rural Kerala.⁶

In our study hypertension prevalence was equally present among both gender (table 2) Hari Shankar et al. (2017) conducted a study in the rural area of Varanasi in the age group 40 years and above and reported prevalence of hypertension in male was 30% and in females 28%⁴. Hypertension significantly associated with socioeconomic class (table 2). Similar results were found by Anshuman Sharma et al. (2015) conducted in rural Madhya Pradesh.⁹

Maximum prevalence was seen in 50-69 years of age group (table 2). This finding is similar to a study conducted by Prabhakumari et al. (2016) in central Kerala.³

In present study the prevalence of prehypertension was found to be 48.9% (table 2). Nearly similar results were found (40.8%) by Anshuman Sharma et al. (2015) who conducted study in rural Madhya Pradesh⁷. Similar results were also found by Laxmaiah et al. (2014) conducted a study in rural Hyderabad⁸.

Prevalence of pre-hypertension was more than hypertension upto the age of 50-59 years, after which it fell down below the hypertension (table 2). Similar results found by Prashant R Kokiwar et al. (2012)⁵.

In this study 34.46% obese were hypertensive (table 3) which is nearly similar to study conducted by Syed Esam Mahmood et al. (2017) in Lucknow where he found (40%) obese were hypertensive⁹.

In present study more than half hypertensive subjects were physically inactive and rest were physically active, as physical activity increases prevalence of hypertension decreases (table 3). No significant association was found between physical activity and blood pressure (table 3) Similarly no association was reported by Prabhakumari C et al. (2016)³ conducted study in central Kerala and Vinay Babu Koganti et al. (2005) conducted study in the age group of 18 years and above in rural Andhra Pradesh¹⁰.

In this study more obese subjects belonged to hypertensive and pre-

hypertensive group no significant association was found between blood pressure and BMI (table 3). Similar results were found in a study conducted by Abhijeet S Ingale et al. (2017) in Aurangabad and Syed Esam Mahmood et al. (2017) in the urban area of Lucknow^{11,9}.

CONCLUSION

This study reveals high burden of hidden hypertension in rural population. Hence the effective screening program for early diagnosis and treatment of hypertension should be started at community level. Health education program regarding change in life style should be implemented.

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