ORIGINAL ARTICLE

A cross- sectional study on prevalence of hypertension and its relationship with selected demographic factors in western Uttar Pradesh

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Abstract

Background: Non-communicable diseases (NCDs) are major contributors of morbidity and mortality in the middle aged and elderly population. **Aim:** The purpose of this study was to estimate the prevalence/distribution of hypertension in persons aged 45 years or above and to find the association with certain selected demographic factors. **Materials and Methods:** The study used a cross-sectional community based survey of the civilian, non-institutionalized population of Agra district through an in-home interview and a clinical examination (measurement of blood pressure). A total of 544 persons from an urban and rural community were selected by multistage simple random sampling technique. **Results:** Out of total 544 participants, 47% and 53% were from urban and rural area respectively. Maximum participants were in the age group of 45-54 year (47.43%).The prevalence of hypertension significantly increased with increasing age, being 28.29% in 45-54 year age group to 62.07% in 75+ age group with statistically significant ($p<0.001$) difference .The overall prevalence of hypertension was found to be 36.42%, which was more common (41.96%) in urban area as compared to rural area (31.46%). Males and females had almost equal (36.49% Vs 35.92%) prevalence of hypertension. The prevalence of hypertension was found to be highest in urban males (40.90%). It was also significantly higher among graduate & above educated group (45.32%). In regard to occupation the hypertension prevalence was lowest among the unskilled laborers (27.27%) and highest among shopkeeper/clerk/teacher/professionals (51.81%) with a significant difference. Majority of the urban participants (50%) were from socioeconomic class I & II, whereas majority from rural background (59.77%) were in socioeconomic class IV & V. The prevalence of hypertension decreased significantly ($p<0.01$) from` 51.11% in S.E. class-I to 30.25% in class-V. About 17.14% of the retired and unemployed persons were having stage II hypertension. **Conclusion:** Strategies to detect and treat hypertension in the early stage have to be implemented early.

Key Words

Community-based; Hypertension; Prevalence; urban; rural

Introduction

Hypertension is an increasingly important medical and public health issue. Developing countries like India are likely to face an enormous burden of Non-communicable diseases (NCDs) in future and of these diseases, hypertension is one of the most important treatable causes of mortality and morbidity in the elderly population. (1,2)

The prevalence of hypertension increases with advancing age to the point where 30 to 50 percent people of 40-59 years of age, more than half of the people of 60–69 year of age and approximately three-fourths of those ≥70 years of age are affected. The age related rise in systolic blood pressure is primarily responsible for an increase in both incidence and prevalence of hypertension with increasing age. Chronic Non-Communicable diseases are important among adult population all over the world. The prevalence of chronic diseases like hypertension, diabetes etc, is showing an upward trend.

Hence the study was undertaken, to measure the prevalence of hypertension in Agra district and identify the associated demographic factors.

Material and Methods

The present cross-sectional study was carried out in randomly selected Agra urban ward no. 55 i.e. New Adarsh Nagar and Theepuri (slum) and village Tehra of block Saiyan. The study was completed in a period of 1½ years i.e. March 2009 to August 2010. Sampling Unit consists of all households having males and females aged 45 years and above in the above selected areas using multistage simple random sampling technique. According to Chennai Urban Rural Epidemiology Study (CURES-52), the overall prevalence of hypertension in age 45 years and above population was approximately 45%. Using this as reference value the sample size of 544 was calculated. All male and female persons aged 45 years and above, who gave their consent for participation in the study after explaining them the purpose of study were selected for the sampling unit. Participants who were seriously ill/ hospitalized were excluded from the study.

For selection of households from urban and rural areas following sampling procedure was adopted. In 1st stage one urban ward (Balkeshwar) and one rural block (Saiyan) were selected randomly from list In 2nd stage one urban locality- New Adarsh Nagar,one slum locality Theepuri and one village Tehra were randomly selected. In the third stage, all the households having persons aged 45 year and above fulfilling the selection criteria were included in the study. All the households were visited personally by the surveyor following left hand rule. The information was entered on a predesigned, pretested schedule from each of registered subjects. A total of 258 persons from urban area and 286 from rural area were registered. The hypertensive status of study participant was assessed by using standard criteria formulated by WHO and U S Seventh Joint National Committee on Detection, Evaluation and Treatment of Hypertension (JNC VII report).

Two blood pressure readings over a period of at least 3 minutes were taken on left arm in sitting position using standard OMRON automated blood pressure recording machine (IDSP operational manual for district surveillance unit by MOHFW).Data were entered in Microsoft Excel spreadsheet. Descriptive statistics like percentage and chi square test were calculated.

Results

Out of total 544 persons who participated in the study, 47% (258) were from urban area and 53% (286) were from rural area. Maximum participants were in the age group of 45-54 year, and the number decreased with increasing age being only 5.33 percent in 75 + year age group. 90.44% of study population was Hindu, 64.61% were from joint families. Almost 50 percent of the rural population was illiterate, whereas 39.53% of the urban population was either graduate or above. Majority females were housewives and males were either farmers (56.25%) or shopkeeper/clerk. As shown in table1, the overall prevalence of hypertension was found to be 36.42%, which was more in urban area (41.96%) as compared to rural area (31.46%).

Males (36.49%) and females (35.92%) had almost equal prevalence of hypertension but the prevalence of hypertension was significantly ($p>0.05$) more in urban males and females (40.90%&42.06%) as compared to rural males and females (32.39%&30.55%).

Prevalence of prehypertension was more (33.33%) in rural area with insignificant difference, however the prevalence of stage I & II were almost similar in two areas .Similarly pre hypertension showed insignificant difference in male & female of both the areas. Stage I hypertension was slightly more prevalent among both males and females in urban areas but difference was insignificant statistically. (Table 2)

The prevalence of hypertension increased significantly with increasing age, being 28.29% in 45-54 year age group to 62.07% in75+ age group. In urban area this increase was from a prevalence of 33.33% to 66.67%, while in rural area, the comparative percentages were 23.91% and 57.14% respectively. All the above mentioned differences were statistically significant ($p<0.001$ (Table 3)

Table 4 shows the distribution of various stages of hypertension in different age groups. It was observed that 31.06% persons were in pre hypertensive stage which increased from 29.06% in 45-54 year age group to 36.26% in 65-74 year age group ,the difference being highly significant ($p<0.005$).Among hypertensive the three fifth were in stage I and two fifth were in stage II hypertension, the prevalence being 22.06% and 14.15% respectively .Similarly the stage I hypertension increase from 20.16% in 45-54 year age group to 24.14% in 75+ year age group, and stage II hypertension increased from 8.14% in 45-54 year age group to 37.93% in 75+ year age group. This age-wise increase in prevalence was statistically significant ($p<0.05$).

The prevalence of hypertension was highest (45.32%) among graduate & above educated group, while it was least (28.57%) in persons educated up to primary and junior high school. A similar pattern was observed in rural area. However this difference was statistically insignificant ($p>0.05$) between the different education groups in both the areas. In regard to occupation the

prevalence of hypertension was 51.81% among shopkeeper/clerk/teacher/professional and with a significant difference of prevalence in other occupation groups .In urban and rural area almost similar pattern was observed but without significant difference. A rising trend in the prevalence of hypertension with increasing socioeconomic status was observed and this difference was highly significant ($p<0.01$) statistically (Table 5).

Table 6 shows that the pre-hypertensive stage was maximum in shopkeeper/clerk/teacher/professional workers being 33.73%.Stage II was maximum in 17.14% of the retired and unemployed persons were and this was found to be minimum (7.79%) in unskilled labourer. This difference was significant among having pre-hypertensive and person being normotensive.

Table 7 Among different socioeconomic classes, the prevalence of pre-hypertension was maximum (33.33%) in S E class 1, however the difference was insignificant ($p>0.05$).The stage II hypertension was maximum (28.89%) in S E class I whereas stage I hypertension was more common (i.e. around 30%) in upper S E classes (S.E. class I to II) and this difference was statistically significant ($p<0.05$).

Discussion

The overall prevalence of hypertension in study population (aged 45 years and above) was found to be 36.42%. It was 36.39% in males and 35.92% in females. The prevalence of hypertension was 41.96% in urban area and 31.46% in rural area. Hypertension was found to be increasing with increase in age of subjects. These findings were also supported by others. (3,4,5,6) Low prevalence of hypertension in present study is probably due to the fact that lower age group were not included in the study in contrast to study by others.(7,8). No significant difference was found among two genders. (9,6)Present study showed an increase in prevalence of hypertension with age which was statistically significant. Others studies were approximately similar to our study.10The prevalence of hypertension was highest (45.32%) among graduate & above educated group, while it was least (28.57%) in persons educated up to primary and junior high school. A similar pattern was observed in rural area, while in urban area prevalence was highest among graduate (47.05%) and minimum in primary to junior high school educated group (30.23%).This finding is also supported by other. (11)

In regard to occupation the prevalence of hypertension was 51.81% among shopkeeper/ clerk/teacher/professional and least prevalence was found in unskilled laborers (27.27%) with a significant difference. Similar trend was observed in study by other (12) except slight variation which was due to change in study area and locality. Probably, the level of occupation may affect physical activity and other aspects of life.

The prevalence of hypertension was more (51.11%,46.08% & 37.88%) in S.E. class I, II & III .All these studies support the findings of present study.(13, 14) Regarding the distribution of study population in various stages of hypertension in different age groups ,it was observed that 31.06% persons were in pre hypertensive stage which increased from 29.06% in 45-54 year age group to 36.26% in 65-74 year age group, the difference being highly significant ($p<0.005$).Some others studies also support the findings of present study. (15, 16)

Conclusion

WHO reported that hypertension is an important public health problem in developing countries. Increase in age, gender education, occupation and social class were found to be associated with hypertension. There is a necessity for the health care providers to look for this trend and advise appropriate preventive measures. So India needs population based prevention and high risk approach based control measure, to halt the upward trend of hypertension.

Authors Contribution

SCG & RA worked as a chief- investigator and RS co- chief investigator while SS was investigator in the present study.

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Tables

TABLE NO. 1 PREVALENCE OF HYPERTENSION IN STUDY POPULATION

Gender	Urban			Rural			Total			Chi-square test
	N.	Hypertension		N.	Hypertension		N.	Hypertension		
		Yes	No		Yes	No		Yes	No	
Male	132	54(40.90)	78(59.07)	142	46(32.39)	96(67.60)	274	100(36.49)	174(63.50)	X^2=2.14, df=1 P>0.05 X^2=3.87 df=1, P<0.05
Female	126	53(42.06)	73(57.93)	144	44(30.55)	100(69.45)	270	97(35.92)	173(64.07)	
Total	258	107(41.96)	151(58.53)	286	90(31.46)	196(68.53)	544	197(36.42)	347(63.78)	X^2=5.88 df=1 P<0.05
X^2 test	X^2=0.04,df=1,P>0.05			X^2=0.11,df=1,P>0.05			X^2=0.02, df=1,P>0.05,			

TABLE NO. 2 ASSOCIATION BETWEEN STAGES OF HYPERTENSION WITH GENDER AND STUDY AREA

Gender	Stages of hypertension				
	N.	Normotensive	Pre-HT	Hypertension Stage-I	Hypertension Stage-II
Male					
Urban	132	39(29.55)	41(31.06)	35(26.52)	19(14.39)
Rural	142	59(41.55)	40(28.17)	34(23.94)	12(8.45)
Female					
Urban	126	37(29.37)	38(30.16)	34(26.98)	1(15.08)
Rural	144	43(29.86)	50(34.72)	30(20.83)	14(9.72)
Total					
Urban	274	76(27.74)	79(28.83)	69(25.18)	31(11.31)
Rural	270	102(37.78)	90(33.33)	64(23.70)	33(12.22)
Chi square test	X^2=0.58, df=1, P>0.05			X^2=0.20, df=1, P>0.05	

TABLE NO. 3 PREVALENCE OF HYPERTENSION IN RELATION TO AGE

Age groups	Urban (N=258)		Rural (N=286)		Total (N=544)	
	No.	HT. (%)	No.	HT. (%)	No.	HT. (%)
45-54 year	120	40(33.33)	138	33(23.91)	258	73(28.29)
55-64 year	79	34(43.04)	93	3(34.41)	172	66(38.37)
65-74 year	44	23(52.27)	41	17(41.46)	85	40(47.05)
75 + year	15	10(66.67)	14	8(57.14)	29	18(62.07)
Chi square test	X^2=9.39,df=3,P<0.05		X^2=10.20,df=3,p<0.05		X^2=20.07,df=3,P<0.001	

TABLE NO. 4 ASSOCIATION OF STAGES OF HYPERTENSION WITH AGE

		Status of hypertension		Hypertension	
Age Group (years)	No.	Normotensive	Pre-HT	Stage-I	Stage-II
45-54	258	110(42.64)	75(29.06)	52(20.16)	21(8.14)
55-64	172	48(27.91)	58(33.72)	41(23.84)	25(14.53)
65-74	85	18(21.18)	27(36.26)	20(23.53)	20(23.53)
75 +	29	2(6.89)	9(31.03)	7(24.14)	11(37.93)
Total	544	178(32.72)	169(31.06)	120(22.06)	77(14.15)
Chi square test		X^2=13.60,df=3,P<0.005		X^2(stage I&II)=8.97,df=3,P<0.05	

TABLE NO. 5 HYPERTENSION IN RELATION TO EDUCATION, OCCUPATION AND INCOME

Variables	Urban (N=258)			Rural (N=286)			Total (N=544)		
	No.	HT.	(%)	No.	HT.	(%)	No.	HT.	(%)
Education									
Illiterate	58	22	(37.93)	143	48	(33.56)	201	70	(34.83)
Primary-junior H.S.	43	13	(30.23)	62	17	(27.41)	105	30	(28.57)
High school/intermediate	55	24	(43.63)	44	10	(22.72)	99	34	(34.34)
Graduate & above	102	48	(47.05)	37	15	(40.54)	139	63	(45.32)
Chi square test	X^2=3.96, df=3, p>0.05			X^2=3.73, df=3, p>0.05			X^2=7.80, df=3, p>0.05		
Occupation									
Unskilled Labour	34	11	(32.35)	43	10	(23.25)	77	21	(27.27)
Farmer/ House wife	113	46	(40.71)	193	56	(29.01)	306	102	(33.33)
Semi-Skilled/skilled labourer	23	08	(34.78)	20	08	(40.0)	43	16	(37.21)
Shopkeeper/Clerk/Prof.	63	32	(50.79)	20	11	(55.0)	83	43	(51.81)
Ret./Unemployment	25	10	(40.00)	10	05	(50.0)	35	15	(42.86)
Chi square test	X^2=3.89, df=4, P>0.05			X^2=9.29, df=4, P>0.05			X^2=13.19, df=4, P<0.05		
Socio-Economic Class									
I	36	19	(52.78)	09	04	(44.44)	45	23	(51.11)
II	78	36	(46.15)	24	11	(45.83)	102	47	(46.08)
III	50	17	(34.0)	82	33	(40.23)	132	50	(37.88)
IV	46	16	(34.78)	100	25	(25.0)	146	41	(28.08)
V	48	19	(39.58)	71	17	(23.94)	119	36	(30.25)
Chi square test	X^2=4.64, df=4, P>0.05			X^2=9.73, df=4, P<0.05			X^2=14.79, df=4, P<0.01		

TABLE NO. 6 ASSOCIATION OF STAGES OF HYPERTENSION WITH OCCUPATION

		Status of hypertension			
Occupation	No.	Normotensive	Pre-HT	Hypertension Stage-I	Hypertension Stage-II
Unemployment/ Retired	35	11(31.43)	9(25.71)	8(25.71)	7(17.14)
Unskilled Labour	77	34(44.16)	22(28.57)	15(19.48)	6(7.79)
Semi-Skilled & Labour	43	16(37.21)	11(25.58)	10(23.26)	6(13.95)
Farmer/House wife	306	105(34.31)	99(32.35)	56(18.30)	46(15.03)
Prof, Teacher, Shopkeeper, Clerk	83	12(14.46)	28(33.73)	18(21.68)	25(30.12)
Total	544	178(32.72)	169(31.06)	108(19.85)	89(16.36)
Chi square test		X^2=10.05,df=4,P<0.05		X^2=5.80,df=4,P>0.05	

TABLE NO. 7 ASSOCIATION OF STAGES OF HYPERTENSION WITH SOCIO-ECONOMIC CLASS

SE class	No.	Normotensive n(%)	Pre-HT n(%)	HTN Stage-I n(%)	HTN Stage-II n(%)
Class I	45	7(15.56)	15(33.33)	10(32.22)	13(28.89)
Class II	102	22(21.57)	33(32.35)	23(22.55)	24(23.53)
Class III	132	46(34.85)	36(27.27)	34(25.76)	16(12.12)
Class IV	146	57(39.04)	48(32.88)	30(20.55)	11(7.53)
Class V	119	46(38.66)	37(31.09)	26(21.85)	10(8.40)
Total	544	178(32.72)	169(31.06)	123 (22.61)	74(13.60)
		X^2=7.85, df=4, P>0.05		X^2=11.32, df=4, P<0.05	