International Journal of Community Medicine and Public Health
Karmakar N et al. Int J Community Med Public Health. 2017 Aug;4(8):2736-2740
http://www.ijcmph.com
pISSN 2394-6032 | eISSN 2394-6040

DOI: http://dx.doi.org/10.18203/2394-6040.ijcmph20173317

Original Research Article

Prevalence of hypertension and its socio-demographic factors among adult population in a rural community of Singur block, Hooghly district, West Bengal

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Received: 14 June 2017
Accepted: 10 July 2017

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ABSTRACT

Background: Non-communicable diseases (NCD) are the leading cause of adult mortality and morbidity worldwide now days. The NCD like hypertension is emerging as a major health problem in India with increasing prevalence significantly in both urban and rural population. The objectives of the study were to find out the prevalence of hypertension and its association with socio-demographic factors among the study subjects, if any.
Methods: This cross-sectional study was conducted from May, 2013 to April, 2014 in rural communities of Singur block among 651 individuals, aged 20 years or above of both sexes except pregnant and seriously ill subjects. Data were collected about education, type of family, family history of hypertension, income etc.
Results: The overall prevalence of hypertension was 26.1% (male 21.8% and female 29.9%). Prevalence increased with increase in age group. Muslim religion, less education and sedentary life styles were found to be significantly associated with hypertension; while socio-economic status had no association with hypertension.
Conclusions: The prevalence of hypertension in the rural population was found to be on the higher side compared to previous reports from India. Strong public health measures need to be seriously implemented to combat hypertension and its consequences.

Keywords: Hypertension, Prevalence, Adult, Community, Rural

INTRODUCTION

Non-communicable diseases (NCDs) are the leading cause of adult mortality and morbidity globally. Among the NCDs, hypertension is one of the important components which are a major chronic lifestyle disease and most prevalent NCD in India.[1] WHO report identifies hypertension, the silent killer, as one of the important risk factors for cardiovascular diseases worldwide. Globally, approximately 40% of adults aged 25 and above had been diagnosed with hypertension; the number of people with the condition rose from 600 million in 1980 to 1 billion in 2008.[2]

Hypertension is reported to be the fourth contributor to premature death in developed countries and the seventh

in developing countries.[3] According to Kearney, worldwide reports indicate that hypertension in 2000 with a prevalence of 26.4% is predicted to increase to prevalence of 29.2% by the year 2025.[4] Hypertension is a significant public health problem in urban as well as in rural areas of India. The prevalence of hypertension has increased by 30 times among the urban population over a period of 55 years and about 10 times among the rural population over a period of 36 years.[5]

The increasing trend of hypertension is very soon going to be built up as a colossal problem not only in the urban areas of India but also in the rural areas. There is no robust, appropriate and organised health education programmes either at individual or at community level to overcome the lack of awareness of the basics of prevention and control of hypertension and its risk factors among the general mass. Moreover there is scarcity of studies related to hypertension in rural areas especially in this part of the country. With this backdrop, the study was undertaken to find out the prevalence of hypertension and its association with socio-demographic factors, if any among adults in Singur block of Hooghly district of West Bengal.

METHODS

A community based, epidemiological study with a cross-sectional design was conducted from May 2013 to April 2014 among adult population aged 20 years or above residing in rural communities of Singur block of Hooghly district of West Bengal which is the rural field practice area of All India Institute of Hygiene and Public Health, Kolkata.

Sample size

In a recent community based study on hypertension among adults in a rural community of central India, prevalence of hypertension was found to be 19.04%.[6] Now considering this prevalence with 20% relative allowable error sample size becomes 409 after applying the formula: $Z_\alpha^2\, pq/L^2$; where, Z_α= 1.96 (Standard normal deviate at a desired confidence level at 95%); p= previous prevalence; q= 100–p; L= allowable error. Since multi-stage random sampling technique was followed to select study population, a 'design effect' of 1.5 and also an additional 5% increase required to compensate for any non-response among study subjects.[7] So, sample size for the study was calculated to be 645 and finally 651 samples were collected for the study.

Sampling design

Two-stage random sampling method was followed for the selection of study subjects. In the first stage, 20% villages were selected randomly out of 64 villages of the study area; i.e., the primary sampling units were villages. In the second stage, from the selected villages required number of adult individual were selected randomly. Therefore the final sampling units were the subjects aged ≥20 years.

Selection criteria

All the inhabitants aged 20 years and more were included, while unwilling individuals, pregnant women and moribund patients were excluded from the study.

Tools

Pre-designed and pre-tested schedule, mercury sphygmo-manometer and stethoscope.

Techniques

Interview of the study subjects, followed by blood pressure measurement (using JNC 7 guidelines) [8] and review of past records like OPD tickets, doctor's prescription etc.

Methods of data collection

Study subjects were interviewed at their family setting after explaining the academic nature of this research and they were assured that information collected from them would be kept confidential. At least 3 attempts were made to interview a particular individual if the person could not be accessed the first time or (s) he was suffering from any acute illness on the days of the earlier visits. During the study, individuals with blood pressure level more than equal to 140/90 mm Hg were advised to visit the nearest union health centres for further investigations and treatment.

Ethical consideration

Approval for the study was taken from the Institutional Ethics Committee of All India Institute of Hygiene and Public Health, Kolkata. Informed written/ verbal consent in local language was obtained from every interviewee.

Operational definition

Hypertension was defined as systolic blood pressure (SBP) ≥140 mm of Hg and or diastolic blood pressure (DBP) ≥90 mm of Hg. An individual previously diagnosed as hypertensive and presently under treatment was also considered as hypertensive.

Statistical analysis

The collected data were entered in Microsoft excel worksheet (Microsoft, Redwoods, WA, USA) and checked for accuracy. After entering the data, it was checked for any duplicate or erroneous entry. Significance of association between hypertension (dependent variable) with the different independent variables was analysed by chi-square (χ^2) test. P value less than 0.05 was considered as statistically significant.

All the statistical analysis were done in SPSS software, version 19.0 (Statistical Package for the Social Sciences Inc, Chicago, IL, USA).

RESULTS

Among 651 participants majority (32.9%) belonged to 20-30 years age group, followed by 22.4% in 30-40 years age group and least (8.3%) were in 60 years and above; 47.2% were male and 52.8% were female. Mean age of the population was 38.4±14.3 years. Most of the study subjects (94.2%) were Hindu and only 5.8% were from Muslim community; 54.2% study subjects belonged to nuclear family and the remaining 45.8% were from joint family. Among the study subjects, 79.9% were currently married followed by 16% who were never married. Least number of study subjects (4.1%) comprised of widow, widower or separated. 30% had a literacy status up to primary school completion followed by 23.2% middle school completion and 16.3% were illiterate.

As per "Classification of activities based on occupations" of National Institute of Nutrition where occupations have been classified as heavy, moderate and sedentary worker; revealed that 74.7% were sedentary workers and remaining 25.3% moderate worker.[9] While carrying out this study by occupation, 42.4% of study populations were housewife and 15.8% farmers. Majority participants (47%) belonged to Class IV socio-economic category followed by 45.3% in Class V socioeconomic category as per modified B. G. Prasad's scale 2013.[10]

Among the study participants, 170 (26.1%) were found to be hypertensive and the remaining 481 (73.9%) were non-hypertensive. Overall, mean SBP was found to be 125.71±16.09 mm Hg with a range of 98 - 210 mm Hg and mean DBP was 80.35±8.37 mm Hg with a range of 60-110 mm Hg. Among 170 hypertensive subjects 82 (48.2%) were already known hypertensive. Figure 1 showed that majority (48.1%) were pre-hypertensive, followed by 25.8% with normal blood pressure and 10.9% and 2.6% were in hypertension stage I and II respectively.

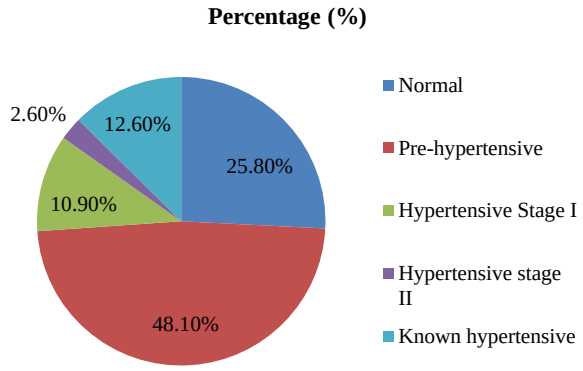

Figure 1: Distribution of the study population according to classification of blood pressure (JNC VII guidelines) (n=651).

Figure 2 showed that mean systolic and diastolic blood pressure in five different age groups where mean SBP and DBP increased with the increase in age except in the ≥60 years age group, where DBP is low comparison to the previous age group. Correlation coefficient with age was found to be 0.485 for SBP and 0.292 for DBP.

Table 1: Distribution of the hypertensive and non-hypertensive study subjects according to Socio-demographic characteristics (n=651).

Characteristics		Hypertensive n (%)	Non-Hypertensive n (%)	Total n (%)	Chi-square and p value
Age	<37 years	42 (12.9)	283 (87.1)	325 (100)	58.525, p<0.001
	≥37 years	128 (39.3)	198 (60.7)	326 (100)	
Gender	Male	67 (21.8)	240 (78.2)	307 (100)	5.541, p= 0.019
	Female	103 (29.9)	241 (70.1)	344 (100)	
Religion	Hindu	153 (24.9)	461 (75.1)	614 (100)	7.997, p=0.005
	Muslim	17 (45.9)	20 (54.1)	37 (100)	
Caste	SC,ST	70 (33.3)	140 (66.7)	210 (100)	8.375, p= 0.004
	OBC, General	100 (22.7)	341 (77.3)	441 (100)	
Marital status	Unmarried	8 (7.7)	96 (92.3)	104 (100)	21.769, p<0.001
	Married and Others	162 (29.6)	385 (70.4)	547 (100)	
Education	Primary and Below	99 (29.7)	234 (70.3)	333 (100)	4.620, p=0.032
	Above primary	71 (22.3)	247 (77.7)	318 (100)	
Occupation	Moderate	33 (20)	132 (80)	165 (100)	4.282, p<0.001
	Sedentary	137 (28.2)	349 (71.8)	486 (100)	
Type of family	Nuclear	73 (20.7)	280 (79.3)	353 (100)	11.801, p<0.001
	Joint	97 (32.6)	201 (67.4)	298 (100)	
S-E status	PCI ≤ 833	82 (25.5)	240 (74.5)	322 (100)	0.139, p=0.710
	PCI > 833	88 (26.7)	241 (73.3)	329 (100)	
Total		170 (26.1)	481 (73.9)	651 (100)	

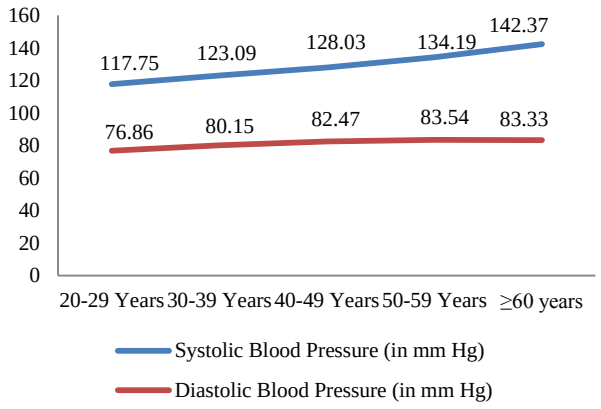

Figure 2: Trend of systolic and diastolic blood pressure according to age group (n=651).

Subjects aged 37 years or above, females, Muslim community, SC/ST community, below primary education, sedentary occupation, joint family had statistically significant ($p<0.05$) association with hypertension by Pearson's chi-square test except socio-economic status (per capita income >833 rupees) (Table 1).

DISCUSSION

In this cross-sectional study, our aim was to explore the prevalence of hypertension in the rural population of Bengal. In rural India, developmental changes like road communication, electrification and mechanized cultivation in recent years have greatly influenced the lifestyle of the rural people. The prevalence of hypertension (26.1%) observed in this study was higher than some previous study by Bhardwaj et al in rural area Nagpur, Vinay in rural Community of Central Maharashtra done in different settings; but lower than some other studies done in rural Dehradun by Mittal, in rural Bangladesh by Rahim et al, in rural Nepal by Vaidya et al.[11-15] This current study finding did not match with that of Kusuma et al in Visakhapatnam district might be due to different study setting in ethnic tribal populations.[16]

Our study showed that with the increasing age progressively more subject with hypertension and that was similar findings with some recent studies.[13,16-19]. In present study, aged populations showed mean SBP and mean DBP increases with the increase in age except in the ≥60 years age group where DBP is low comparison to the previous age group.

In this study we observed that the prevalence rate of hypertension in male was 21.8% and in female was 29.9% respectively which was statistically significant and was similar findings with some recent studies done by Mittal et al, Dong et al ($p<0.05$); but, didn't match with few other studies by Vinay et al, Rahim et al, Vaidya et al where results showed slightly higher prevalence in males than females.[12-15,19]

There was an association between marital status and hypertension which was found statistically significant in chi-square test but did not matched with findings of Saxena P et al[20]. There was an association between education level and hypertension which was found statistically significant in chi-square test which was similar with the study finding by Manimunda et al.[17] This current study finding did not match with that of Sharma et al, Hypertension Study Group.[21-22]

Most of the hypertensive (28.2%) was found among sedentary worker, which was found statistically significant ($p<0.05$) by chi-square test similar to Rahim et al but this finding did not match with that of Kannan et al might be due to use of different classification of occupation based activities in a different setting.[14,23]

Hypertension was found more (32.6%) in those study subjects who were from joint family ($p<0.05$). This current study finding was similar with the studies-Kannan et al where they considered about the number of the family members in a family rather than type of family.[23] There was an association between socio-economic status and hypertension was similar to Sayeed et al; but did not matched with that of Kokiwar et al, Rahim et al, Todkar et al.[6,12,24,25]

CONCLUSION

The prevalence of hypertension in the rural population was found to be on the higher side compared to some previous reports of India and other Asian studies. It shall be important to follow this population in the future to see the trend of BP in the rural India. The study also has indirectly pointed out that even though there is existing programme, there is inadequacy from the perspective of public health and that we have not been able to do enough to prevent the problem. So, India needs to seriously implement programmes to address hypertension and its consequences.

ACKNOWLEDGEMENTS

We acknowledge the families who participated in this study. We are grateful to all the health workers, ASHA of respective villages for their extensive collaboration, without which this study would not have been conducted.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

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Cite this article as: Karmakar N, Naiya S, Saha I, Sinha R, Sahoo SK, Dasgupta A. Prevalence of hypertension and its socio-demographic factors among adult population in a rural community of Singur block, Hooghly district, West Bengal. Int J Community Med Public Health 2017;4:2736-40.