

A study on hypertension in geriatric population in a slum of Kolkata

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Abstract

Background: Noncommunicable diseases (NCDs) are the major contributors of morbidity and mortality in the elderly people. Among them, hypertension is one of the most important treatable causes of morbidity and mortality in elderly population. Furthermore, high blood pressure is a modifiable risk factor of cardiovascular disease.

Objective: To find out the magnitude of hypertension and its association with sociodemographic and behavioral characteristics.

Materials and Methods: A cross-sectional study was conducted on 200 elderly people (age ≥ 60 years) in an urban slum, Chetla, under the purview of All India Institute of Hygiene and Public Health (AIIPH), Kolkata, during a study period of 2 months. The blood pressure of participants was measured following the standard operation procedures as laid down by the WHO. Hypertension was classified as per Joint National Committee (JNC)-8 criteria. Sociodemographic characteristics and other risk factors were assessed during the study with the help of a semi-structured, pretested questionnaire.

Result: The overall prevalence of hypertension was 64%. The prevalence among male and female subjects was 62.8% and 64.9%, respectively. About 40.6% cases of hypertension were newly detected. Among the hypertensive people, 92.6% of them were smokers, 83.7% of them consumed alcohols, 66% of them used smokeless tobacco, and 70.3% of them were taking extra salt. This study revealed that hypertension was significantly associated with age, social class, physical activity, alcohol intake, smoking status, and intake of extra salt.

Conclusion: The study sample was small, and in view of limited studies in this area, a further research using a large sample is needed. Greater emphasis should be laid on the most disadvantaged and neglected (i.e., the poor geriatric population) in the society in terms of hypertension management and on reinforcing all preventive measures such as physical activities, correct diet, maintenance of correct body mass index, and good compliance of drug intake. This will in the long run help in the enhancement of hypertension control.


KEY WORDS: Geriatric population, NCD, hypertension, JNC-8, risk factors

Introduction

Aging is a universal process. In the words of Seneca, "old age is an incurable disease." But, more recently,

Sir James Sterling Ross commented, "you do not heal old age, you protect it, you promote it and you extend it." These are in fact the principles of preventive medicine.^[1] Industrialization, urbanization, education, and exposure to western life styles are bringing changes in values and life style.^[1]

According to the Census 2011, the population of the elderly people (aged 60 years and older) in India is around 100 million (i.e., 8.3% of the total population).^[2] The elderly people, by themselves, are a vulnerable group, and noncommunicable diseases (NCDs) are clearly a major morbidity in this age group. In India, NCDs were responsible for 53% of deaths and 44% of disability-adjusted life-years lost. Developing countries, such as India, are likely to face an

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enormous burden of NCDs in future; of these diseases, hypertension is one of the most important treatable causes of mortality and morbidity in the elderly population. Furthermore, high blood pressure (BP) is a modifiable risk factor for cardiovascular disease (CVD). Data from the Framingham Heart Study showed increasing cardiovascular morbidity with increasing systolic or diastolic pressure in those aged 65 years and older.^[3]

One of the cornerstones of the primary prevention of CVDs has been screening for high BP and antihypertensive drug treatment. A considerable percentage of older persons with hypertension are not detected or are not adequately treated for hypertension. Burden of hypertension is increasing owing to rapidly escalating life expectancy rates. Health-seeking behavior of the elderly is not influenced because of their economic instability, reduced physical endurance, social isolation, reduced cognitive ability, dependency, and loneliness.

It is, therefore, essential to diagnose hypertension at an early stage and take appropriate health-seeking measures to prevent its deadly complication in the later stage of life. From this point of view, this study was carried out to document the prevalence of hypertension and its risk factors in the elderly population of Chetla, Kolkata, India.

Objective

- (1) To study the socioeconomic and demographic characteristics of the study population.
- (2) To find out the prevalence of hypertension among the study population.
- (3) To find out the association of hypertension with sociodemographic and other risk factors, if any.

Materials and Methods

Study Type and Setting

This community-based cross-sectional study was conducted in an urban slum of Chetla, Kolkata, West Bengal, which is the urban field practice area of All India Institute of Hygiene and Public Health (AIIPH), Kolkata.

Time Line

The study was conducted for 2 months starting from March 1, 2014, to May 31, 2014, with the first 45 days for data collection and the remaining days for data analysis.

Study Subjects

The study included people aged 60 years and older.

Inclusion criteria

All the people who were aged 60 years or older and residing for more than 6 months in the study area were included.

Exclusion criteria

- (1) Unwilling individuals,
- (2) Seriously ill/unable to answer the questions.
- (3) Younger than 60 years.

Sample Size

According to Hazarika *et al.*,^[4] the prevalence of hypertension was 63% among the geriatric population. By considering this value and an allowable error of 10%, the minimum sample size was 93, by applying the formula $4PQ/L^2$, where P = prevalence, $Q = 1 - P$, L = allowable error. It is a multistage sampling; so, applying design effect on the sample size will be $90 \times 2 = 180$.

A total of 200 elderly people were selected for the study purpose.

Sampling Design

The total population of this slum was 33,138. The whole slum area has been divided into six sectors. Sector 1 was chosen randomly out of the six sectors. Line listing of all the 651 persons aged 60 years and older was done, and 200 such individuals were identified by systematic random sampling (every third elderly person was considered). Adult individuals aged ≥ 60 years were chosen to be included in the study population.

The survey questionnaire included questions about the physical activity, alcohol intake, smoking status, and about salt intake. In our study, sedentary activity was considered for those who do little or no exercise. If he/she spends a lot of time sitting at a desk or watching television, without working out regularly, they were considered a sedentary activity person, and others were considered as nonsedentary persons. In case of alcohol intake, in our study, those who consumed more than 14 units in case of female subjects and more than 21 units in case of male subjects per week were considered to be alcoholic.^[5] Adults who have smoked 100 cigarettes in their lifetime and currently smoke cigarettes every day (daily) or some days (nondaily) were considered as smokers.^[6] Extra salt intake was considered when the study subjects took extra salt in their diet in spite of salt use in cooking purpose.

Definition of Hypertension

In the general population aged ≥ 60 years, systolic blood pressure (SBP) ≥ 150 mm Hg or diastolic blood pressure (DBP) ≥ 90 mm Hg without any history of diabetes or chronic kidney disease is referred to as hypertension, according to Joint National Committee (JNC)-8 criteria.^[7]

Method of Data Collection

All the participants were explained about the purpose of the study that the study would be an academic research in nature and all the data provided by the participants would be kept confidential. After getting their approval regarding participation in this study, the consent papers were duly signed by them. Then, information was obtained about their

sociodemographic characteristics, dietary pattern, salt intake, alcohol consumption, and smoking habit. The measurement of BP was done as per the standard guidelines, that is, by using mercury sphygmomanometer in the right arm in the sitting position with feet kept firmly on ground and arm kept at the level of the heart. BP was measured on two separate occasions with a minimum interval of at least 5 min between the two measurements. Care was taken on the day of measurement that the participants did not smoke or take caffeine 30 min before the measurement of BP. BP measurements were not done for participants with any acute painful condition such as dental pain or joint pain. BP was measured in subsequent visits. BP should be maintained at a level of $\geq 150/90$ mm Hg in individuals without any history of diabetes or any kidney disease. On the other hand, BP should be maintained at $\geq 140/90$ mm Hg for those with a history of diabetes or kidney disease. SBP measured on two separate occasions with a minimum interval of at least 5 min between the two measurements or a self-reported history of taking antihypertensive medications is defined as hypertension.^[8]

Study Tools

- (1) A predesigned pretested schedule,
- (2) Stethoscope,
- (3) Portable weighing machine,
- (4) A nonstretchable measuring tape, and
- (5) Sphygmomanometer.

Study Variables

Objective No. 1

- (1) Socioeconomic factors (occupation, income, and socioeconomic status)
- (2) Demographic factors (age, gender, religion, marital status, and type of the family—nuclear/joint)

Objective No 2

Clinical examination and BP measurement

Objective No 3

Socioeconomic and demographic factors along with lifestyle and behavioral factors and anthropometric measurements

Statistical Analysis and Plan

Data were analyzed using appropriate statistical methods by SPSS software (version 20).

Ethical Issues

A protocol was prepared and approved by the institution Ethics Committee. This research study was descriptive, cross-sectional, and noninterventional in nature. The participants were made aware about the nature and purpose of the research study. It was also informed to all the participants that all the data provided by the participants will be kept

confidential and will be used only for research or academic purpose. Willingness and signature of the participants to be included in the study was taken on a previously designed consent form prepared in local language.

The female participants were examined in the presence of female attendance or female family members. The participants were made aware accordingly about hypertension and lifestyle modification, if required.

Result

There were 200 geriatric persons aged between 60 and 97 years who participated in our study. The mean age of the study population was 67.14 ± 7.81 years. Among the total study population, 86 (43%) were men and 114 (57%)

Table 1: Sociodemographic characteristic of the study population ($n = 200$)

Covariates	Number (%)
Age (years)	
60–69	134 (67)
70–79	46 (23)
80–89	14 (07)
≥ 90	06 (03)
Sex	
Male	86 (43)
Female	114 (57)
PCI	
Class II	20 (10)
Class III	22 (11)
Class IV	80 (40)
Class-IV	78 (39)
Physical activity	
Sedentary	152 (76)
Moderate	42 (21)
Severe	06 (03)
Alcohol intake	
Yes	86 (43)
No	114 (57)
Smoking	
Yes	54 (27)
No	146 (73)
Smokeless tobacco	
Yes	106 (53)
No	94 (47)
Extra salt intake	
Yes	148 (74)
No	52 (26)

Table 2: Prevalence of hypertension in the study population ($n = 200$)

Hypertension	Number, N (%)	Male, N (%)	Female, N (%)
Yes	128 (64)	54 (62.8)	74 (64.9)
No	72 (36)	32 (37.2)	40 (35.1)

Table 3: Prevalence of hypertension with associated factors in bivariate and multivariate logistic regression ($n = 200$)

Covariates	Hypertensive, n (%)	Non-Hypertensive, n (%)	OR (95% CI)	AOR (95% CI)
Sex				
Female	74 (64.9)	40 (35.1)	1.09 (0.61–1.96)	1.96 (0.65–5.91)
Male	54 (62.8)	32 (37.2)	1	1
Age group (years)				
≥80	18 (90)	02 (10)	5.72 (1.28–25.44)	28.83 (4.72–176.04)**
60–79	110 (61.1)	70 (38.9)	1	1
PCI				
Classes II and III	40 (95.2)	02 (4.8)	15.90 (3.71–68.12)	25 (4.81–138.42)**
Classes IV and V	88 (55.7)	70 (44.3)	1	1
Physical activity				
Sedentary	108 (71.1)	44 (28.9)	3.43 (1.75–6.73)	3.13 (1.04–9.41)**
Nonsedentary	20 (41.7)	28 (58.3)	1	1
Alcohol intake				
Yes	72 (83.7)	14 (16.3)	5.32 (2.69–10.51)	9.08 (2.97–27.73)**
No	56(49.1)	58 (50.9)	1	1
Smoking				
Yes	50 (92.6)	04 (7.4)	10.89 (3.74–31.74)	14.60 (3.70–57.51)**
No	78 (53.4)	68 (46.6)	1	1
Tobacco				
Yes	70 (66)	36 (34)	1.20 (0.67–2.15)	1.28 (0.51–3.20)
No	58 (61.7)	36 (38.3)	1	1
Extra salt intake				
Yes	104 (70.3)	44 (29.7)	2.73 (1.44–5.27)	5.09 (1.83–14.13)**
No	24 (46.2)	28 (53.8)	1	1

Table 4: Distribution of hypertensive population on the basis of their health-seeking behaviors ($n = 128$)

Hypertension, n (%)	Already known, n (%)	Detected during survey, n (%)
128 (100)	76 (59.4)	52 (40.6)

were women. Among them, 20 (10%) of them belonged to Class II, 22 (11%) of them to Class III, 80 (40%) of them to Class IV, and 78 (39%) of them to Class V socioeconomic status according to modified BG Prasad scale 2014. Among the total study population, 152 (76%) of them belonged to the sedentary activity group, 42 (21%) of them belonged to the moderate activity group, and six (3%) of them belonged to the severe physical activity group. Among the study participants, 86 (43%) of them were consuming alcohol, 54 (27%) of them were smokers, while 106 (73%) were taking smokeless tobacco and 148 (74%) practiced an intake of extra salt in their diet [Table 1].

Table 2 revealed that 64% (128/200) of the participants were hypertensive according to JNC-8 criteria, and among them, 62.9% (54/128) were men and 64.9% (74/128) were women. So, the prevalence of hypertension is slightly higher in women than in men.

Table 3 showed that, in bivariate analysis, factors that were found to increase the risk of hypertension were increased age [OR = 5.72 (1.28–25.44)], social class (per capita

income according to modified B.G Prasad scale 2014) [OR = 15.90 (3.71–68.12)], physical activity [OR = 3.43 (1.75–6.73)], consumption of alcohol [OR = 5.32 (2.69–10.51)], smoking [OR = 10.89 (3.74–31.74)], and consumption of extra salt [OR = 2.73 (1.44–5.27)] and were significantly associated. Adjusted to other variables in multivariate analysis were factors such as age [AOR = 28.83 (4.72–176.04)], social class [AOR = 25 (4.81–138.42)], physical activity [AOR = 3.13 (1.04–9.41)], alcohol consumption [AOR = 9.08 (2.97–27.73)], smoking [AOR = 14.60 (3.70–57.51)], and extra salt consumption [AOR = 5.09 (1.83–14.13)]. Most of the significant ORs in univariate regression were augmented in multivariate regression.

Table 4 shows that, among the 128 hypertensive patients, 76 (59.4%) of them were aware about their disease, and they received treatment regularly, and 52 (40.6%) of them were newly detected and were not on any treatment.

Discussion

Increase in ageing population is associated with the influence of environmental factors such as urbanization, sedentary lifestyle, and detribalization created by acculturation process, which increase the burden of hypertension as indicated in various studies.^[9] The overall prevalence of hypertension in our study was 64%. Among the hypertensive population, 62.8% were men and 64.9%

women, which was almost similar to the studies carried out by Hazarika et al.^[4] (prevalence 63.63%, men 64.2%, and women 62.89%) and Singh et al.^[10] (62.07%). However, Chainnakali and Mohan^[3] and Manandhar et al.^[11] in their study showed that the prevalence of hypertension is 40.5% and 44.9% in men and women, respectively, which do not correlate with our study. In our study, the prevalence of hypertension in female subjects is more, which is similar to the study done by Chainnakali and Mohan^[3] and Ahmad and Jafar.^[12] Increasing trend of prevalence was observed in the higher age group in this study population. A higher prevalence of hypertension was also observed in female subjects in comparison with male subjects probably because of hormonal interaction. In our study, hypertension is high in the middle and higher socioeconomic status group of population, which is similar to the study done by Ahmada et al.^[12] Apart from age, sex, and socioeconomic status, risk factors associated with hypertension in the elderly population of our study were high in sedentary life style (71.1%), which is more than that showed in the study done by Awosan et al.^[13] (50.7%). In our study, the prevalence of hypertension in persons consuming alcohol and smoking was 83% and 92.6%, respectively; it is more than those in the studies by Mulassi et al.^[14] (38.4% and 29.3%, respectively) and Everson et al.^[15] (35.5% and 33.1%, respectively). Extra salt consumption is an important risk factor for hypertension. In our study, 70.3% of the population who consumed extra salt in their diet were hypertensive, which was more than the finding by Radhika et al.^[16] (48.4%).

Conclusion

Hypertension is a major public health problem in the elderly population. In our finding, hypertension is associated with some modifiable risk factors such as, physical activity, alcohol consumption, smoking, and intake of extra salt in their diet. The main recommendations of this study are to establish screening programs for the early detection of hypertension and to develop health promotion programs to encourage behavior change for prevention and control of hypertension in the early age group.

Greater emphasis should be given on the most disadvantaged (the older men and educationally backward section) in terms of hypertension management and on reinforcing weight loss and combining drugs for control of hypertension.

References

1. Prakash R, Choudhary SK, Singh US. A study of morbidity pattern among geriatric population in an urban area of Udaipur Rajasthan. *Indian J Community Med* 2004;29(1):35–40.

2. *Indian's Elderly Population: Some Fundamentals@2009–2013*. Available at: <http://gktoday.in> (Last accessed on April, 4 2014)
3. Chainnakali P, Mohan B. Hypertension in the elderly: Prevalence and health seeking behavior. *N Am J Med Sci* 2012;4(11):558–62.
4. Hazarika NC, Biswas D, Mahanta J. Hypertension in the elderly population of Assam. *J Assoc Physicians India* 2003;51:567–73.
5. Eberth B, Olajide D, Craig P, Ludbrook A. Smoking-related disease risk, area deprivation and health behaviours. *J Public Health* 2014;36(1):72–80.
6. US Centers for Disease Control and Prevention. Health behaviors of adults: United States, 2005-2007. *Vital and Health Statistics, Series 10, Number 245, Appendix II, p. 80*. Atlanta, GA: CDC, 2010.
7. Available at: <http://www.pharmacytimes.com/news/the-jnc-8-hypertension-guidelines-an-in-depth-guide> (last accessed on April 3, 2014).
8. National Health and Nutrition Examination Survey III (cycle 2). Revised July 1993.
9. Jaddou HY, Bateiha AM, Ailouni KM. Prevalence, awareness and management of hypertension in a recently urbanized community, eastern Jordan. *J Hum Hypertens* 2000;14(8):497–501.
10. Singh R, Agarwal R, Singh S, Gupta SC. A cross-sectional study on prevalence of hypertension and its relationship with selected demographic factors in western Uttar Pradesh. *Indian J Community Health* 2014;26(1):10–4.
11. Manandhar K, Koju R, Sinha NP, Humagain S. Prevalence and associated risk factors of hypertension among people aged 50 years and more in Banepa Municipality, Nepal. *Kathmandu Univ Med J* 2012;10(39):35–8.
12. Ahmad K, Jafar TH. Prevalence and determinants of blood pressure screening in Pakistan. *J Hypertens* 2005;23(11):1979–84.
13. Awosan KJ, Ibrahim MTO, Essien E, Yusuf AA, Okolo AC. Dietary pattern, lifestyle, nutrition status and prevalence of hypertension among traders in Sokoto Central market, Sokoto, Nigeria. *Inter J Nutr Metabol* 2014;6(1):9–17.
14. Mulassi AH, Hadid C, Borracci RA, Labruna MC, Picarel AE, Robilotte AN, et al. Eating habits, physical activity, smoking and alcohol consumption in adolescents attending school in the province of Buenos Aires. *Arch Argent Paediatr* 2010;108(1):45–54.
15. Everson SA, Kaplan GA, Goldberg DE, Salonen JT. Hypertension incidence is predicted by high levels of hopelessness in Finnish men. *Hypertension* 2000;35(2):561–7.
16. Radhika G, Sathya RM, Sudha V, Ganesan A, Mohan V. Dietary salt intake and hypertension in urban south Indian population. *J Assoc Physicians India* 2007;55:405–11.

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