Original Article

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Hypertension and Characteristics Related to It among Elderly Hospitalized Patients: A Cross-Sectional Study in Medicine Department of a Tertiary Care Hospital

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Abstract

Background: As people age, the prevalence of hypertension significantly rises. There is little data on the prevalence of hypertension and its contributing variables among the hospitalized elderly Bangladeshis, particularly in tertiary care settings. the purpose of the study was aimed to investigate the burden of hypertension and contributing causes in older persons admitted to a Bangladeshi teaching hospital for tertiary care.

Materials and methods: This was a descriptive cross sectional study conducted during the period from July 2022 to June 2023. The study included 150 in patients who were admitted and at least 60 years old. Using an organized case record form, information was gathered through interviews, medical records, and examinations of demographic, socioeconomic, lifestyle, family history, comorbidity, anti-hypertensive drug use and blood pressure management data.Separate bivariate and multivariate logistic regression analyses were conducted to identify the factors associated with hypertension and results were expressed as Odds Ratios (ORs) with 95% CI.

Results: The mean age of the patients was 64.6 ±4.6 years. Overall, prevalence of hypertension was 47.3% (41.3% old cases and 6% newly diagnosed) among them 45 (63.3%) were male. Out of 62 known hypertensive, majority (95.2%) was not taking their anti-hypertensive drugs regularly and optimal blood pressure was not achieved in 64.5% of them. Factors including being of male (OR:2.839, 95% CI:1.053, 7.654) no formal education (OR:2.217, 95% CI:1.059, 4.64) being obese by BMI criteria (OR:3.904,95% CI: 1.565, 9.559) and having a family history of hypertension (OR:8.297, 95% CI: 1.841, 17.162) were found to be significantly associated with hypertension.

Conclusion: To sum up, about 50% of the elderly patients hospitalized in the medicine wards of a tertiary-level hospital had hypertension, which necessitates immediate steps to address this issue.

Key words: Elderly; Hypertension; Population.

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Introduction

Globally, the percentage of the population that is getting older is rising quickly. The population of the Asia-Pacific area is aging at a rate never seen before by 2050, there will likely be more than twice as many elderly people—from 535 million in 2015 to over 1.3 billion.[1] More than 13 million Bangladeshis, or 8% of the nation's total population, are over 60 as of 2019. By 2050, there will be 36 million persons over 60 and the percentage of older people will have doubled to 21.9%.[2,3]

In most developing nations, like Bangladesh, where the population is aging, the co-existence of several chronic health disorders among the elderly is a serious public health concern. One of the most common chronic illnesses affecting the elderly is hypertension.[4] Nevertheless, the prevalence of hypertension among older persons is high, there is strong evidence that maintaining appropriate blood pressure control in this population lowers mortality and morbidity.[5] A significant risk factor for cardiovascular disease, hypertension has a high morbidity and mortality rate.[6] Stroke, ischemic heart disease, heart failure and chronic renal disease are all serious conditions that shorten life expectancy and quality of life and indicate a decline in overall functioning, particularly in the elderly. These conditions strongly linked to inadequate blood pressure regulation.[7]

According to recent population-based studies, the prevalence of hypertension among Bangladesh's elderly population ranges from 23% to 56%.[8-10] Hypertension has both non-modifiable and modifiable risk factors. Two non-modifiable risk factors for hypertension are an aging population

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and a positive family history.[11] some important modifiable risk factors are unhealthy diets (Excess salt intake, low intake of fruits and vegetables and a diet high in saturated fat and trans fats) less physical activity, smoking, alcohol consumption, overweight or obese and co-existing diseases such as diabetes or kidney disease.[12--16]

One of the older population's more vulnerable subgroups is the hospitalized senior population. Additionally, a review of chronic illnesses and drugs is made possible by care transitions like hospitalization. There were some studies done in respect to hypertension on community-based elderly people, however, publicly available research on the prevalence and risk factors of hypertension in Bangladeshi adults 60 years of age who are hospitalized was limited. So, this study was aimed to investigate the burden of hypertension and contributing causes in older persons admitted to a Bangladeshi teaching hospital for tertiary care.

Materials and methods

It was a descriptive cross-sectional study carried on 150 patients aged 60 years admitted to the medicine ward of Chittagong Medical College Hospital (CMCH) during the period from July 2022 to June 2023. Severely ill patients and those who refused to participate were excluded.

After getting informed consent, sociodemographic data and data regarding smoking status, physical activity and comorbidity were collected by using a structured case record form on admission by face-to-face interviewing the participants at their bedside.Blood pressure was measured by a validated aneroid sphygmomanometer machine. The auscultatory method of BP measurement was used. Caffeine, exercise, and smoking were advised to avoid for at least 30 minutes prior to measurement. Persons were seated quietly for at least 5 minutes, with arm supported at heart level. Measurements were taken in the right mid upper limb. An appropriately sized cuff (Cuff bladder encircling at least 80% of the arm) were used, two measurements were taken and the average was recorded.For data analysis purposes, the average blood pressure measurement was taken into account.Anthropometric measurements were taken based on the WHO guidelines as specified in the Food and Nutrition Technical Assistance (FANTA) anthropometry manual.[17] Weight, height, waist circumference and hip circumference were taken with the subjects wearing light clothes and no shoes. Weight was measured to the nearest 0.1 kg by modern electronic digital LCD weighing machines placed on a flat surface. Height was measured to the nearest 0.1 cm while the study subjects stood in the erect posture. Waist circumference was measured by placing the tape horizontally midway between the lowest border of the ribs and iliac crest on the mid-axiliary line. Hip circumference was measured at a level parallel to the floor, at the largest circumference of the buttocks to the nearest 0.5 cm.

To ensure data quality, the senior researcher directly observed 5% of the interviews and re-interviewee another 5% of the randomly selected participants. Interim analyses were performed to check data quality. All the measuring tools were calibrated routinely. Prior permission was obtained from the proper authorities before begin the study.

Results

Total 150 patients admitted patients' age 60 years and above were interviewed for the study from the medicine wards of CMCH. The findings of the study are summarized in the following Tables and graphs.

Table I Hypertension status of the participants

Characteristics	Frequency	Percentage (%)
No hypertension	79	52.7
Known case of hypertension	62	41.3
Newly diagnosed at admission	9	6.0

Prevalence of hypertension was 47.3% (71/150) 6% were diagnosed after hospitalization.

Table II Hypertension related characteristics of the participants (n=150)

Characteristics	Frequency	Percentage (%)
Family history of hypertension		
Absent	87	58.0
Present	63	42.0
Ever measure blood pressure by a doctor or other health worker		
No	36	24.0
Yes	114	76.0
Adherence to anti-hypertensive medication (n=62)		
Irregular	3	4.8
Regular	59	95.2
Blood pressure status of the known hypertensive cases (n=62)		
Controlled	22	35.5
Uncontrolled	40	64.5

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Out of 150 elderly patients, 63 (42%) had positive family history for hypertension and 36 (24%) of the patients did not ever measure their blood pressure before hospitalization. Among the 62 known hypertensive cases, majority (95.2%) were taking their anti-hypertensive drugs regularly; however, optimal blood pressure was not achieved in 64.5% of them.

Table III Pattern of comorbidity of the participants (n=150)

Comorbidity pattern	Frequency	Percentage (%)
No comorbidity	33	22.0
DM	45	40%
IHD	17	11.3%
DM+IHD	11	7.3%
DM+CKD	14	9.3%

DM: Diabetes Mellitus, CKD: Chronic Kidney Diseasem IHD: Ischemic Heart Disease.

Out of 150 participants, 33 (22%) participants were free from any comorbid conditions. The most frequent comorbidity was DM (70/150,47%), followed by IHD (28/150, 18.7%), and CKD (14/150, 9.3%).

Table IV Association of hypertension with sociodemographic characteristics of the participants (n=150)

Variables	Hypertension		p value
	Yes (n=71)	No (n=79)	
Age group			
60-69 years	56 (45.2)	68 (54.8)	0.245*
70 years	15 (57.7)	11 (42.3)	
Gender			
Male	45 (52.9)	40 (47.1)	0.116*
Female	26 (40.0)	39 (60.0)	
Education			
Illiterate	39 (52.7)	35 (47.3)	0.194*
Literate	32 (42.1)	44 (57.9)	
Marital status			
Married	27 (43.5)	35 (56.6)	0.436*
Single	44 (50.0)	44 (50.0)	
Vocational status			
Working	15 (57.7)	11 (42.3)	0.245*
Not working	66 (45.2)	68 (54.8)	

Data were expressed as frequency (Percentage).
*Chi-square test.

Table IV shows that, the prevalence of hypertension was higher among participants' age 70 years (57.7%) than the participants in 60-69 years group (45.2%) but the difference failed to reach statistical significance. Similar non-significant higher prevalence of hypertension was seen among the male, illiterate, Muslim, single and working participants than their counterpart (p>0.05).

Table V Association of hypertension with lifestyle and clinical characteristics of the participants (n=150)

Variables	Hypertension		p value
	Yes (n=71)	No (n=79)	
Current or former smoker			
No	28 (40.0)	42 (60.0)	0.092*
Yes	43 (53.8)	37 (46.3)	
Current or former smokeless tobacco user			
No	27 (55.1)	22 (44.9)	0.184*
Yes	44 (43.6)	57 (56.4)	
Physically activity			
Active	44 (45.8)	52 (54.2)	0.624*
Inactive	27 (50.0)	27 (50.0)	
FH of hypertension			
Absent	10 (14.1)	77 (97.5)	<0.001*
Present	61 (85.9)	2 (2.5)	
Comorbid diabetes			
Absent	36 (48.0)	39 (52.0)	0.870*
Present	35 (46.7)	40 (53.3)	
BMI			
Normal	47 (42.0)	65 (58.0)	0.024*
Elevated	24 (63.2)	14 (36.8)	
WC			
Normal	48 (45.7)	57 (54.3)	0.544*
Elevated	23 (51.1)	22 (48.9)	
WHR			
Normal	26 (44.1)	33 (55.9)	0.519*
Elevated	45 (49.5)	46 (50.5)	
WHtR			
Normal	37 (47.4)	41 (52.6)	0.979*
Elevated	34 (47.2)	38 (52.8)	

Data were expressed as frequency (Percentage). *Chi-square test.

Table V shows that, only obesity defined by BMI has significant association with hypertension in the entire studied population.

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Table VI Multivariate regression analysis showing factors associated with hypertension among elderly participants

Variables	B	p value	OR	95% C.I. for OR	
				Lower	Upper
Male vs. Female	1.044	0.039	2.839	1.053	7.654
Illiterate vs. literate	0.796	0.035	2.217	1.059	4.640
Muslim vs. Hindu	-0.683	0.185	0.505	0.184	1.386
Smoker vs. nonsmoker	0.215	0.625	1.240	0.523	2.937
Smokeless tobacco users vs. Nonusers	-0.489	0.191	0.613	0.295	1.277
Family history of hypertension	2.111	0.012	8.297	1.841	17.162
BMI normal vs. high	1.362	0.003	3.904	1.595	9.559

OR: Odds Ratio, CI: Confidence Interval.

Factors including being of male (OR:2.839, 95%CI:1.053, 7.654) no formal education (OR:2.217, 95% CI:1.059, 4.64) being obese by BMI criteria (OR:3.904,95% CI: 1.565, 9.559) and having a family history of hypertension (OR:8.297, 95% CI: 1.841, 17.162) were found to be significantly associated with hypertension.

Discussion

In the current study, 47.3% of the elderly hospitalized patients had hypertension overall. It may be assumed that the prevalence in the study population would be higher than that reported elsewhere, however this does not seem to be the case and given research participants were identified upon hospital presentation. Al Kibria et al. analyzed the data from the BDHS 2011 and reported that 30% of males and 52% of females aged 65 years were hypertensive.[8] Another study reported that an estimated 23% of the elderly people in rural Bangladesh had undiagnosed hypertension.[9] In a 2020 systematic review and meta-analysis the weighted pooled prevalence of hypertension in Bangladeshi population aged ≥60 years was 53%.[18] However, a hospital-based study conducted in Sydney, Australia reported a much higher prevalence (69%) of hypertension among elderly hospitalized patients.[19]

Only 64.5% of the known hypertension patients had ideal blood pressure, despite the fact that the majority of them (95.2%) took their antihypertensive medications on a regular basis. According to Khanam et al. 68% of older adults in rural Bangladesh who were diagnosed and undergoing treatment had uncontrolled hypertension, while an estimated 23% of those individuals had undetected hypertension.[9] A study conducted in Sydney Australia found that, when relevant comorbidity was taken into account, one-third (33.4%) of all patients with a confirmed diagnosis of hypertension were at target blood pressure upon hospital admission.[19]

Similar to the Saka et al. study, regression analysis revealed that sex had an independent connection with current hypertension and that older men were more likely than older women to have hypertension (OR:2.839, 95%CI:1.053, 7.654).[16] The prevalence of hypertension and sex were found to be significantly correlated in this study (52.9% for males and 40% for women). The results of the current study are in contrast to those of earlier Bangladeshi studies that found a higher prevalence of hypertension in women.[10, 20]The disparity was most likely caused by the study's hospital-based methodology and small sample size. Prior research was population-based and involved a sizable population.

Higher education has been linked to hypertension in previous research, because it can boost wealth status and lead to a sedentary lifestyle, which in turn may raise the risk of hypertension.[8,10,21] On the other hand, compared to those who were formally educated, those who were not had a higher chance of having hypertension (OR:2.217, 95% CI:1.059, 4.64). This disparity may result from the current study participants' generally lower rates of higher education.

The current study indicated that having a family history of hypertension was substantially related with having hypertension (OR:8.297, 95% CI: 1.841, 17.162). Increased awareness, treatment, and control of hypertension are also substantially correlated with a family history of the condition.Those who are aware of their elevated risk for hypertension pay particular attention to their blood pressure levels.

According to the current study, BMI was found to be independently linked to hypertension; respondents who were obese had a 3.9-fold higher risk of having hypertension than those who were normal. This result was consistent with earlier findings from population-based research conducted in Taiwan, Bangladesh, Ethiopia and India.[9,10,15,22,23]

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This study yielded important information to improve our understanding of the hypertension burden among elderly patients admitted to a tertiary level hospital in Bangladesh. Development of strategies that improve the management and control of hypertension among elderly are needed to respond to the urgent needs for disease control and comorbidity prevention.

Limitations

When analyzing the findings, it is important to take into account the methodological limitations of this study. The study only involved one center and had a small sample size. The study's connections may not be causal because of the cross-sectional design's lack of temporality. In order to validate the diagnosis of hypertension, blood pressure was measured on a single day as opposed to longitudinally over several days. Recall and social desirability biases (Self-reported parameters such as alcohol, tobacco, physical activity and self-reported comorbidities) are present in this study.

Conclusion

About half of the senior patients admitted to a tertiary level hospital's medicine wards had hypertension, and in the majority of these cases, the hypertension was not adequately controlled. Male gender, lack of formal education, obesity, and a family history of hypertension were among the factors that were found to be strongly linked to hospitalized older adults with hypertension.

Recommendations

Bangladesh needs to act quickly to address the issue of hypertension, which accounts for about half of the hospitalized aged population. The design of screening and intervention programs aimed at enhancing the health and well-being of the elderly requires particular consideration from policymakers. Advocating the importance of controlling blood pressure is an essential step. Additionally, the Bangladeshi government should prioritize early treatment of hypertension and address the factors (e.g. Lack of formal education, obesity etc.) related to hospitalizationamong the hypertensive elderly people.

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Contribution of authors

MHA-Acquisition of data, data analysis, Interpretation of data, drafting & final approval.

RR-Acquisition of data data analysis, drafting, critical revision & final approval.

MMA-Data analysis, drafting & final approval.

MAS-Conception, design, interpretation of data, critical revision & final approval.

Disclosure

All the authors declared no competing interest.

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