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Factors Associated with Hypertension in the Selected Community

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Abstract

Introduction: Non-communicable disease causes over 36 million deaths globally each year. And among the NCD deaths, over 82% of premature deaths occur in underdeveloped and developing countries. Some of the non-communicable diseases like hypertension, diabetes and asthma are emerging as major health problems in Bangladesh. The Bangladesh government has given high priority to research these particular diseases. But although there are many global studies regarding the risk factors of hypertension, not much research has been done regarding the increasing risk of hypertension in rural areas. This study aims to determine the correlation of various factors with hypertension among the population of a rural locality. ***Methods:*** This was a cross-sectional study conducted in the rural area of Dumki upazilla of Patuakhali district. Sample population was selected following simple random sampling technique. Socio-demographic information, information about smoking, family history of hypertension status were collected using a pre-prepared questionnaire. Blood pressure, body weight and height of 255 individuals between the age range of 40-90 years of both sexes were measured and collected. ***Result:*** Among the participants, 98 were male and 157 were female. The mean age of the participants was 45.28 years, and mean weight was 56.27 kg. 40% of the participants were aged between 41-50 years and 38.04% were aged between 51-60 years. Among the participants, majority were educated, and only 16.47% were illiterate. Majority of the participants (39.61%) were housewives, and 10.98% were service holders. Only 7.45% of the participants were unemployed. The biggest risk factor in the present study participants was excessive salt intake, present in 64.84% of the participants. This was closely followed by family history of hypertension, present in 61.18% of the participants. High BMI was also present in 48.63% of the participants. ***Conclusion:*** Increased BMI and high blood pressure are high risk factors for hypertension. Hypertension was observed to occur more in the female population, and the risk of hypertension increased with age. Excessive salt intake and smoking, Jarda consumption and tobacco chewing are also some risk factors observed in this particular rural study.

Keywords: Hypertension, Smoking, BMI, Systolic, Diastolic.

INTRODUCTION

Hypertension is generally known as high blood pressure. It can lead to severe health complications and greatly increases the risk of heart diseases. High blood pressure is the underlying cause of a major share of diseases globally, and is noticeably higher in the low-income countries than in the high-income countries. Elevated blood pressure is responsible for approximately 60% of stroke and over 50% of ischemic heart diseases [1]. Hypertensive people contribute to half of this burden; the rest was among the people with lesser degrees of high blood pressure [2]. An epidemiological shift in the prevalence of hypertension in developing countries has been observed, as compared to developed countries [2, 3]. Studies from India and Bangladesh have shown an upward trend in the prevalence of hypertension. The prevalence of hypertension has increased by 30 times among the urban population in the last 55 years, and about 10 times among the rural population in the last 36 years.[4] Hypertension elevates the risk of CVD, and end-stage renal disease [3, 4]. Hypertension is associated with CVD mortality, stroke mortality and stroke morbidity [3, 5]. There is no definite lower threshold of blood pressure yet for potential danger of cardiovascular mortality [6, 7]. The people with high normal blood

pressure (systolic blood pressures (SBP) from 120 to 139 mmHg and/or diastolic blood pressures (DBP) from 80 and 89 mmHg) develop hypertension faster and are in an increased risk of cardiovascular disease [8, 9]. The Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (JNC 7), introduced the new category of "hypertension", defined as systolic BP≥140 mm Hg and/or diastolic BP 90≥ mm Hg [10]. Recent studies found an association between hypertension and increased risk of coronary artery disease [11, 12]. Follow up studies also reported that hypertension is an independent risk factor for cardiovascular and cerebrovascular diseases [13]. Various hypotheses have been put forward to explain this rising trend of hypertension in developing countries, and among these, consequence of urbanization such as change in life style pattern, diet and stress have been implicated. Dramatic changes in life style from traditional to modern have led to physical inactivity due to technological advances. Increasing population growth and technological advances have shrunken the employment opportunities, particularly among the young generation leading to stress and hypertension in the young population, including students and laborers in developing counties. Hypertension is a significant public health challenge and has a major impact on healthcare costs, contributing to around 10% of total healthcare spending globally [5, 6]. Hypertension imposes a serious economic burden on individuals, households, healthcare systems and the entire nation as a whole [7]. In most developing countries, including Bangladesh, hypertension often remains undiagnosed and untreated and, even when treated, a large proportion still have uncontrolled blood pressure (BP) [11, 12]. In recent years, hypertension and CVDs have increased in South-East Asian countries, including Bangladesh, as a result of rapid urbanization, increased life expectancy, unhealthy diet, and lifestyle changes [13]. The Bangladesh non-communicable diseases (NCD) risk factor survey in 2010 estimated the prevalence of hypertension among adults between 16 20%. Also, the Bangladesh health, nutrition and demographic survey in 2011 reported the prevalence of hypertension among adults 34%. Despite effective therapies and lifestyle interventions, adequate control of hypertension remains a challenge [12]. Lifestyle measures for lowering BP can potentially reduce requirements for anti-hypertensive medications, prevent development of hypertension and its complications and are important for controlling other CVD risk factors, illustrating the importance of a multifactorial approach for reducing hypertension [13]. Most of the similar studies reported only the prevalence and risk factors of hypertension, but did not perform any statistical analysis of the predictors of hypertension. A proper assessment of the risk factors for hypertension among the rural population in Bangladesh is important to develop strategies and policies for effective prevention and control. This study aimed to determine the prevalence of hypertension and its factors focusing on the rural areas of Bangladesh.

OBJECTIVE

General Objective

- To determine the risk factors and case detection of hypertension among the people in a selected rural area of Patuakhali.

Specific Objectives

- To measure and observe the blood pressure and weight of all participants

METHODS

This was a descriptive cross-sectional community-based study conducted at the Dumki Upazilla, Patuakhali. Simple random sampling technique was used to select a total of 948 participants at the initial stages. For the study population, the rural people of 40 years and above from both genders, living in Dumki upazilla, were selected. After following the inclusion and exclusion criteria, the final study sample size was determined to be 255. The study process was explained to them in laymen's terms and proper consent was taken from all participants. A pre-tested structured questionnaire and face to face interview was used for data collection. Ethical approval was also obtained from the ethical review committee of Patuakhali Medical College, Patuakhali.

Inclusion Criteria

- Male and female ≥ 40 years of age.
- Subjects willing to participate in the study

Exclusion Criteria

- < 40 years of age
- Severely ill subjects
- Unwilling to participate in the study

RESULTS

This study was conducted with a total of 255 participants. Among the participants, 98 were male and 157 were female. The mean age of the participants was 45.28 years, and mean weight was 56.27 kg. 40% of the participants were aged between 41-50 years and 38.04% were aged between 51-60 years. Among the participants, majority were educated, and only 16.47% were illiterate. Majority of the participants (39.61%) were housewives, and 10.98% were service holders. Only 7.45% of the participants were unemployed. The biggest risk factor in the present study participants was excessive salt intake, present in 64.84% of the participants. This was closely followed by family history of hypertension, present in 61.18% of the participants. High BMI was also present in 48.63% of the participants.

Table-I: Characteristics study population by following variables

Variables	Mean	±SD
Age in years	45.28	15.26
Systolic Blood Pressure (SBP)	129.71	10.22
Diastolic Blood Pressure (DBP)	74.49	11.68
Height in CM	152.99	9.4
Weight in KG	56.27	11.17
Body Mass Index (BMI)	24.01	4.45

The mean age of the participants was 45.28 years. The participants had Mean ±SD SBP of 129.71±10.22 and a Mean ±SD diastolic BP of 74.49±11.68. The mean height of the participants was 152.99 cm, and mean ± SD weight was 56.27±11.17 kg.

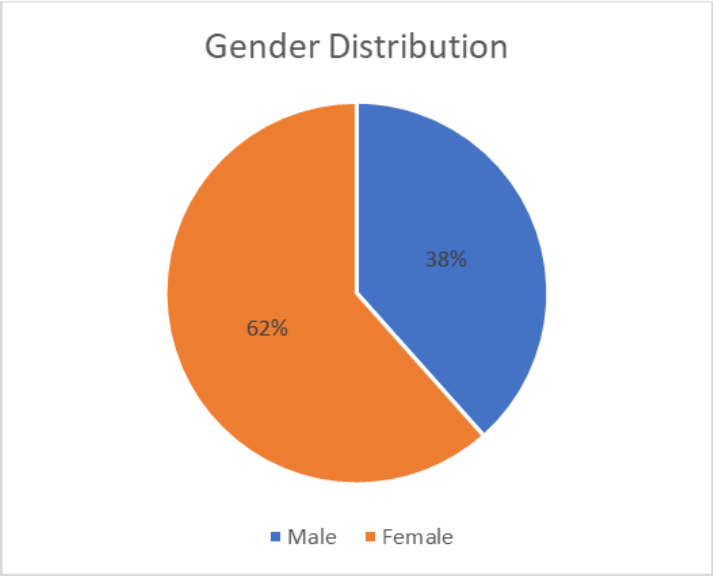

Figure I: Gender distribution of the participants (n=255)

Among the participants, almost 2/3rd (62%) of the participants were female, and only 38% were male.

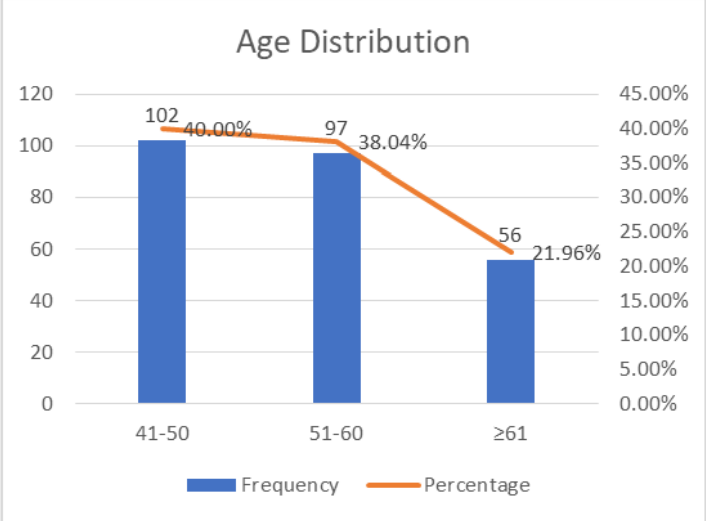

Figure II: Age distribution of the participants (n=255)

All the participants were older than 40 years, according to selection criteria. 40% of the participants were between the age of 41-50 years. Following this ratio, 38.04% of the participants were aged between 51-60 years, and only 21.96% were older than 60 years of age.

Table II: Sociodemographic Status of the participants (n=255)

Sociodemographic Status	Frequency	Percentage
Educational Status		
Illiterate	42	16.47%
Primary	80	31.37%
SSC	83	32.55%
HSC	20	7.84%
Bachelor	17	6.67%
Masters	10	3.92%
Others	3	1.18%
Occupation Status		
Service holder	28	10.98%
Businessman	31	12.16%
Housewife	101	39.61%
Day labour	53	20.78%
Unemployed	19	7.45%
Others	23	9.02%
Marital Status		
Unmarried	28	10.98%
Married	201	78.82%
Widow	25	9.80%
Separated	1	0.39%

Among the participants, majority were educated, and only 16.47% were illiterate. 32.55% received education up to SSC levels, and 31.37% received only primary level education. 7.84% studied upto HSC, 6.67% studied upto bachelor level, and only 3.92% had studied upto masters. The remaining 9.02% received other forms of education. Only 7.45% of the participants were unemployed, and 20.78% were day laborer's. Majority of the participants (39.61%) were housewives, and 10.98% were service holders. 12.16% were businessman, and 9.02% were involved in other jobs. Among the participants, majority (78.82%) were married, and 10.98% were unmarried. 9.80% were widow and 1 participant was separated.

Table-III: Relation between age categories with systolic hypertension status.

Age in groups	Hypertension		Non hypertension		Total	Chi-Square value	P-Value
41-50	13	25.2%	89	74.8%	102	127.26	>0.05
51-60	20	35%	77	65%	97		
60>	25	44%	31	55.5%	56		
Total	58	20.8%	197	79.2%	255		

Table III shows the relation between age categories with systolic hypertension status. Among the participants of the youngest age group of 41-50 years, 74.8% were non-hypertension, and only 25.2% had systolic hypertension. Among the participants between the age of 51-60 years, 35% had hypertension and 65% didn't. Among the participants older than 60 years, 44% had systolic hypertension. Among the total participant, 20.8% had systolic hypertension.

Table-IV: Relation between age categories with diastolic hypertension status

Age in groups	Hypertension		Non hypertension		Total	Chi-Square value	P-Value
41-50	27	23.7%	77	67.3%	104	45.15	<0.05
51-60	36	40.7%	40	59.3%	76		
61>	35	39.7%	40	60.6%	75		
Total	98	28.3%	157	71.7%	255		

Among the total 255 participants, 28.3% had diastolic hypertension. Among the participants.

Table-IV shows the relation between age categories with diastolic hypertension status, increasing age show with increasing status of diastolic hypertension. Significant difference is shown between different age group.

Table-V: Relation between age categories with BMI Category of the study population.

Age	BMI Category								Total	Chi-Square value	P-Value
	<18.5	%	18.5-24.99	%	25-29.99	%	30>	%			
41-50	20	9.40%	30	43.40%	29	43.60%	25	12.60%	104	26.05	<0.05
51-60	5	5.70%	22	48.60%	22	48.60%	23	8.60%	65		
61>	20	10.90%	35	55.50%	35	55.50%	16	8.80%	86		
Total	45	8.20%	87	52.40%	87	52.40%	68	10.00%	255		

Table V shows among the BMI category 59.1% normal among the group the age of 40-50 years. BMI value with different age groups is statistically significant (p<0.05).

Table-VI: Relation between SBP with BMI Category

SBP	BMI Category								Total	Chi-Square value	P-Value
	<18.5	%	18.5-24.99	%	25-29.99	%	30>	%			
≥90	15	7.50%	33	42.90%	35	34.00%	29	15.70%	118	21.36%	<0.05
<90	28	8.50%	49	56.20%	38	27.70%	22	7.80%	137		
Total	43	8.20%	88	52.40%	73	29.00%	51	10.00%	255		

Table-VI shows systolic blood pressure according to SBP with BMI category. significant different from each to the group.

Table-VII: Relation between DBP with BMI Category.

DBP	BMC Category								Total	Chi-Square value	P-Value
	<18.5	%	18.5-24.99	%	25-29.99	%	30>	%			
≥90	15	7.50%	33	42.90%	35	34.00%	29	15.70%	118	21.36%	<0.05
<90	28	8.50%	49	56.20%	38	27.70%	22	7.80%	137		
Total	43	8.20%	88	52.40%	73	29.00%	51	10.00%	255		

Table- VII shows systolic blood pressure according to DBP with BMI category significantly different from each of the group.

DISCUSSION

Bangladesh is a developing country with many rural areas that fall behind in terms of general lifestyle and medical facilities. This was the first study in Bangladesh reporting the prevalence and risk factors of hypertension focusing on the rural people of Bangladesh. Hypertension in now globally recognized as an important public health problem. Nevertheless, the prevalence of pre-hypertension varies considerably in different countries, which may be due to ethnicity, as well as various local factors, such as climate and lifestyle. Less in know about the factors associated with prehypertension among the Asian people, let alone Bangladeshis. This study reported the prevalence and associated risk factors related to hypertension. Increasing age and higher BMI were positively associated with hypertension. This finding was consistent with findings from other studies. In this study, we found that increasing age was an independent risk factor for hypertension. This was similar to other studies where age was found to be a significant risk factor for hypertension. The observed association between age and hypertension was well reported in various studies worldwide. Age is an un-modifiable risk factor, therefore other modifiable risk factors should be controlled through proper and necessary interventions. For example, controlling weight may counter the age effect and delay the progression to hypertension, as increasing BMI was found to be an independent and important risk factor for hypertension in this study. Relationship of higher BMI with hypertension was also observed in various other studies. Increasing BMI, even the normal range compared to the below normal range, is associated with hypertension. Evidence suggests that overweight and obesity are the strongest predictor of hypertension. Body weight is the balance between consumption and expenditure of energy. Further research is needed to examine the role of diet and effect of physical activity on and hypertension in this population. Cohort studies confirmed that the risk of cardiovascular mortality starts with blood pressure level as low as 115/75 mm Hg and increases in a linear approach for every 20/10 mm Hg rise of blood pressure [8]. Recognizing and classifying individuals with pre-hypertension directs us to concentrate on individuals with increased CVD risk and in whom valuable therapeutic interventions are to apply to prevent or delay the onset of hypertension. Prehypertension, often clustered with other risk factors like high BMI, increases the risk of cardiovascular diseases. Our findings may not be generalized for the whole country, but almost 75% of the population lives in rural areas in

Bangladesh. The accuracy of our findings was supported by our large sample size. Our study showed that the hypertension prevalence was high among people with high BMI and obesity. The similar findings were also observed in different studies conducted in different rural area of India. In this study we also observed that high prevalence of hypertension of patients with positive family history of hypertension. It was observed that the prevalence of hypertension showed a moderate increase in the rural population of Bangladesh, and the risk of hypertension was higher in females of the older age group, with high BMI.

Limitations of the Study

The study was conducted in a single location. So, the results may not represent the whole demographic of Bangladesh**.**

CONCLUSION

The study showed that in rural areas, increased BMI and high blood pressure are high risk factors for hypertension. Hypertension was observed to occur more in the female population, and the risk of hypertension increased with age. Excessive salt intake and smoking, Jarda consumption and tobacco chewing are also some risk factors observed in this particular rural study.

RECOMMENDATION

According to the study findings, an active lifestyle and weight reduction are recommended for decreased risk of CVD and hypertension. Changes in eating habits and reduction in extra salt intake is also recommended.

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Conflict of interest: None declared

Ethical approval: The study was approved by the ethical review committee of Patuakhali Medical College, Patuakhali.

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