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Insightful Perspectives on Normal and High Blood Pressure in Bangladesh

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Abstract

The purpose of the study was to investigate age-specific hypertension patterns and the alarming age for hypertension in Bangladesh. The data were collected from Rajshahi district using a stratified multistage sampling technique based on the scheduled questionnaire for this study. The percentiles and percentage distributions have been used. It was found that the number of systolic hypertensive patients (60.40%) were greater than diastolic hypertensive patients (47.90%) in old age group (≥61 years) where diastolic hypertensive patients (7.40%) were greater than systolic hypertensive patients (3.80%) in young age group (≤39 years) and in middle age group (40-60 years) both are same. Hence, young age (≤39 years) was a risk period for the occurrence of diastolic hypertension than systolic and old age (≥61years) was a risk period for the occurrence of systolic hypertension than diastolic, when middle age (40-60 years) was also a risk period for the occurrence of both types of hypertension. The differences between the same percentiles of systolic and diastolic blood pressure were varying from 51 mmHg to 93 mmHg for hypertensive respondents, whereas it was the same for normotensive. Hence, the abnormality (>40 mmHg) of the differences is an indicator of hypertension or prehypertension. The Study will help to develop awareness about hypertension in the middle-aged group (40-60 years.

Keywords: Systolic Blood Pressure, Diastolic Blood Pressure, Hypertension, Young Age, Bangladesh.

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1. INTRODUCTION

Hypertension is a silent killer of human life, and the number of hypertensive patients is increasing globally and nationally. Blood pressure is read as two numbers, systolic (upper value) and diastolic (lower value). The normal average Blood Pressure of an adult is 120 / 80 mm Hg. Values above 140/90 are considered high blood pressure or hypertension. WHO (2023) Global Report on Hypertension estimated that the number of hypertensive adults almost doubled globally during the last three decades, from 650 million in 1990 to 1.3 billion adults by 2019. The health impact of increasing trends of high blood pressure translates to 10.8 million avoidable deaths annually and 235 million years of life lost or lived with disability. Globally, almost every 1 in 3 adults is hypertensive, with male prevalence slightly higher than females in the under-50-year age group. Beyond the age of 50, the prevalence reaches nearly 49%, or every 1 out of 2 individuals, with nearly equal prevalence among both men and women. While early diagnosis and timely treatment are important, nearly 46% of individuals were never diagnosed. Of those diagnosed, only 42% were on treatment, with nearly half among these having their blood pressure controlled. Hence, in most countries, there are significant gaps in diagnosis and treatment coverage, with low-income countries facing the major brunt of illness (WHO, 2024).

Health is wealth, and the sound health of the Bangladeshi people is the primary goal of all development plans. But the poor health of Bangladeshi people is an intractable problem like poverty. Poor health occurs due to poverty, malnutrition, disease, lack of education, sex discrimination, etc. Among the mentioned causes or diseases, hypertension plays a destructive role in health. There is no disease that cannot lead the poor health. Among the leading diseases, hypertension is one that may lead to heart attack, stroke, heart failure, paralysis, kidney disease, eye damage, etc. (Chobanian, 2003). Although a lot of development programs are being implemented all over the country, Bangladesh is still considered as high mortality and least developed countries in the world. To reduce the high mortality, especially premature deaths, the Bangladesh Government has taken various initiatives; some of these have been successful, and some are running. Also, various international and non-governmental institutes have taken necessary steps to reduce cause-specific deaths and to improve the health condition. It is apparent from the above discussion that the total health expenditure of the government is a countable part, and steps taken against diseases by the government, as well as non-government and international institutes, are valuable. But in spite of undertaking large health development programs after independence in 1971, the health development (by controlling the spread of various diseases in a timely manner) of the Bangladeshi people has not been remarkably achieved. The prevalence of various diseases, including hypertension and related diseases, is spreading uncontrollably. So,

there may be some problems in the mode of health development strategy, and also may also be a gap in establishing the risk factors of various diseases, including hypertension. However, it is evident from the above features that some problem exists in hypertension disease control programs and in studies to recognize the risk factors of hypertension in Bangladesh, and also, a sufficient number of systematic and in-depth research works have not yet been conducted at the grassroots level nationally and individually to explore the nature, patterns, and impact of hypertension. Hence, the risk factors of hypertension ought to be identified through critical analysis. From this view, the researcher undertook to carry out this research and present research work that may point out the age-specific hypertension patterns and alarming age-specific hypertension. Also, the research work provides some policy recommendations to obtain significant progress.

2. Literature Review

Hypertension is a risk factor for premature death and a barrier to sound health. So, it is essential to formulate an appropriate strategy to control hypertension for a healthy life. Discussing the literature reviews (Hoque et al., 2012; Islam et al., 2012; Islam et al., 2012; Rahim et al., 2012; ICDDR, B, 2011; Khanam et al., 2011; Kokiwar, 2011; Zaman et al., 2010; Midha et al., 2009; Agrawal et al., 2008; Chen et al., 2006a; Chen et al., 2006b; Saha et al., 2006; Alamgir et al., 2005; Chen, 2005; Sayeed et al., 2005; Cooper-Dehoff et al., 2004; Chobanian et al., 2003; Sayeed et al., 2003; Sayeed et al., 2002; Hannan et al., 2001; Moula et al., 2001; WHO, 2001a; WHO, 2001b; Bond et al., 2000; Zaman and Rouf, 1999; Hoque et al., 1998; Sayeed et al., 1995; Sayeed 1994; Khandakar, 1993; Islam et al., 1983; Islam et al., 1979; Ullah, 1976;), it is clear that many studies about hypertension in nationally and internationally have been conducted in biological aspect through a lot of researchers or institutions. Nearly half of the people with hypertension globally are currently unaware of their condition. More than three-quarters of adults with hypertension live in low- and middle-income countries (WHO, 2023). In 2011, over a third of adults (38.7%) in urban Bangladesh had hypertension, a number that rose by 22.6% in 2017-18. Though rural areas had lower hypertension prevalence in 2011 (36%), it surged to 64% in 2017-18, surpassing the rate in urban areas (Parvin, 2024). The overall age-standardized prevalence of hypertension was 26.2% with men: 23.5% and women: 28.9% (Khan, 2021). The range of hypertension prevalence is from 1.10% to 75.0% and the overall weighted pooled prevalence of hypertension is 20.0% (Chowdhury, 2020). The prevalence of hypertension was 17.9% (95% CI: 16.2–19.7), indicating a 22.8% increase in prevalence (Islam, 2012). The prevalence of self-reported hypertension was 12.5% (men 10.9% and women 13.9%) in Bangladesh (Koly, 2015). The previous studies indicate that any expected research about the age-specific hypertensive patterns and alarming age of hypertension in socio-demographic aspects has not

yet been conducted in Bangladesh. Thus, this study on hypertension is designed to identify an insight pattern of high blood pressure or hypertension in Bangladesh.

3. Data and Methods

3.1. Data

Using stratified multistage sampling, the data of size 2250 were collected using personal interviews from the population of all people aged above 10 years in the Rajshahi district. Blood pressure (systolic and diastolic) and age were measured by numerical measurement. Also, the quantitative variables Blood pressure (systolic and diastolic) and age were measured in millimeters of mercury (mm Hg) and in years, respectively.

3.2. Measurement of Hypertension

Blood pressure is measured in millimeters of mercury (mm Hg). Normal blood pressure varies with age, weight, and physical status. Normally, it ranges from 100 to 139 for systolic and from 60 to 89 for diastolic. Thus, blood pressure $\geq$ (140/90) is considered as hypertension, and $\leq$ (100/60) is as low blood pressure or hypotension (Bernier et al., 1999).

3.3. Methods

To identify an insight pattern of high blood pressure or hypertension in Bangladesh, percentiles and percentage distribution have been used.

4. RESULTS AND DISCUSSION

4.1. Hypertensive and Normotensive Patterns of Blood Pressure

The different types of percentiles of age are calculated and shown in Table 1. It shows that 5% respondents are below-equal 16 years old, 25% are below-equal 25 years old, 50% are below-equal 35 years old, 60% are below-equal 39 years old, 75% are below-equal 46 years old, 90% are below-equal 60 years old, 95% are below-equal 65 years old, 99% are below-equal 80 years old, and 100% are below-equal 95 years old. The same table presents that 60% respondents are less-equal 39 years old, 30% are between 40 to 60 years old, and only 10% are above-equal 61 years old.

Table 1: Distribution of Percentiles of Age of Respondents

Percentiles	5^{th}	10^{th}	25^{th}	50^{th}	60^{th}	75^{th}	90^{th}	95^{th}	99^{th}	100^{th}

Age (in Year)	16	18	25	35	39	46	60	65	80	95
Percentiles		**1st - 60th**				**61th - 90th**			**91th - 100th**	
Age Interval (in Year)		≤39				40-60			≥61	

The rates of systolic and diastolic hypertension and comparisons are displayed in Table 2 which presents that systolic hypertensive patients (60.40%) are greater than diastolic hypertensive patients (47.90%) in oldest age group (≥61 years) where diastolic hypertensive patients (7.40%) are greater than systolic hypertensive patients (3.80%) in youngest age group (≤39 years) and in middle age group (40-60 years) both are same. Hence, young age (≤39 years) is a risk period for the occurrence of diastolic hypertension than systolic and old age (≥61years) is a risk period for the occurrence of systolic hypertension than diastolic, when middle age (40-60 years) is also a risk period for the occurrence of both types of hypertension.

Table 2: Comparison between the Rates of Systolic and Diastolic Hypertension

	Percentiles	**1st - 60th**	**61th - 90th**	**91th - 100th**
	Age (Years) Intervals According to Percentiles	**≤39**	**40-60**	**≥61**
Systolic Hypertension (%)		3.80	34.00	60.40
Diastolic Hypertension (%)		7.40	34.10	47.90

The different percentiles of systolic and diastolic blood pressure of hypertensive and normotensive respondents are displayed in Table 3, in which the differences between the same percentiles of systolic and diastolic blood pressure are almost the same for normotensive respondents. Also, the constant difference is 40 mmHg. But the differences between the same percentiles of systolic and diastolic blood pressure vary from 51 mmHg to 93 mmHg for hypertensive respondents. Hence, the abnormality (>40 mmHg) of the differences is an indicator of hypertension or prehypertension.

Table 3: Comparison between Percentiles of Systolic and Diastolic Blood Pressure

Percentiles	5th	10th	25th	50th	60th	75th	90th	95th	99th	100th

Normotensive										
Systolic Blood Pressure (mm Hg)	103	105	110	114	115	117	118	119	119	**119**
Diastolic Blood Pressure (mm Hg)	63	65	70	74	75	76	78	79	79	**79**
Difference	40	40	40	40	40	41	40	40	40	**40**
Hypertensive										
Systolic Blood Pressure (mm Hg)	141	142	145	152	157	164	178	187	217	**244**
Diastolic Blood Pressure (mm Hg)	90	91	92	96	98	102	110	118	132	**151**
Difference	**51**	**51**	**53**	**56**	**59**	**62**	**68**	**69**	**85**	**93**

5. CONCLUSION

The study found that the rate of diastolic hypertension is higher than systolic hypertension in the age group <40years and lower than systolic hypertension in the age group >60years. But the rate of both systolic and diastolic hypertension is near about the same in the age group 40-60years. Though with increasing age the rate of both type hypertension is increasing but young age (<40years) is a more risk period for occurring diastolic hypertension than systolic and old age (>60years) is a more risk period for the occurrence of systolic hypertension than diastolic when middle age (40-60 years) is also risk period for occurring both type of hypertension. The differences between two same percentiles of systolic and diastolic blood pressure are increasing with increasing percentiles cut-offs for hypertensive respondents, and the differences are almost the same with increasing percentiles for normotensive. The study suggests that people should measure their blood pressure and health checkups in regular basis. The government should take necessary steps to increase awareness among people about the risk of hypertension. The study had not touched on the biological aspect. Hence, future research can explore the biological aspect of hypertension.

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