

# Prevalence of Hypertension in a selected Rural Area of Mymensingh.

Hasan AHM<sup>1</sup>, Alam FS<sup>2</sup>, Hossain MT<sup>3</sup>, Begum M<sup>4</sup>, Dipu SS<sup>5</sup>, Tahera S<sup>6</sup>

## Abstract

This cross-sectional descriptive study was carried out from January 2015 to March 2016 in villages of 12 Bhavokhali union, Sadar upazila, Mymensingh. The study was done on 408 subjects who were selected purposively. Data were collected on a pre-designed questionnaire by direct interviewing the respondents. Data analysis was done using SPSS version 16. Prevalence of hypertension was 21.32%. Mean age was 39.22 years and standard deviation 14.81 years. Prevalence of hypertension was 46.30% among persons over 60 years of age, 37.11% among persons having family history of hypertension, 61.54% among persons having diabetes mellitus, 43.96% among persons having BMI more than or equal to 25, 29.41% among those having sedentary lifestyle, 22.14% among those having the habit of added salt intake, 33.75% among smokers and 25.95% among persons having the habit of smokeless tobacco intake. Though female had low prevalence of hypertension (18.77%), female working outside had higher prevalence 31.59%. Women of reproductive age group had lower prevalence of hypertension (15.56%) among whom oral contraceptive pill users had increased prevalence of hypertension 16.82%. Prevalence of hypertension found in this study was lower in comparison to global prevalence and results of other studies.

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**Key-words:** Prevalence, Hypertension, Rural area.

## Introduction

Optimum blood pressure is required to maintain blood supply to all tissues and organs of our body which is essential for smooth functioning of our body. In early 20<sup>th</sup> century physicians observed that blood pressure rises with advancing age and they thought that it was a natural process. But later on it was observed that raised blood pressure has grave consequences on our health influencing mortality, morbidity and disability. Hypertension is largely asymptomatic. So it is called silent killer. We have selected rural area because 66% of population in Bangladesh lives in rural areas.<sup>1</sup> In 2010, 31.1% of the world's adults had hypertension.<sup>2</sup> It is the most common cause of outpatient visit to a physician.<sup>3</sup> Raised blood pressure is a major risk factor for coronary heart disease and ischemic as well as hemorrhagic stroke. Worldwide, raised blood pressure is estimated to cause 7.5 million deaths in 2008, about 12.8% of the total of all deaths.<sup>4</sup> In 2015 worldwide all causes of death contributed 56.4 million deaths while ischemic heart disease and stroke accounted for a combined 15 million deaths.<sup>5</sup> Worldwide hypertension

accounted for 57 million disability adjusted life years or 3.7% of total DALYS in 2008.<sup>4</sup> Hypertension has increasing trend in developing countries: tripled in Nepal over 25 years<sup>6</sup> and Bangladesh is following increasing trend (1976: 1.10%, 1995 to 2009: 13.5% and 1995-2010: 13.7%)<sup>7,8,9</sup> which reflects rapid urbanization, increased life expectancy, unhealthy diet, and lifestyle changes. Kidney is both a target and a cause for hypertension. In most of the cases cause of hypertension is not known. 5% of cases have known causes

1. \*Dr. AHM Hasan  
Assistant Professor, Community Medicine,  
Community Based Medical College Bangladesh
2. Dr. Fakir Sameul Alam  
Assistant Professor, Community Medicine,  
Community Based Medical College Bangladesh.
3. Dr. Md. Tufael Hossain  
Assistant Professor, Community Medicine,  
Community Based Medical College Bangladesh.
4. Dr. Maksuda Begum  
Assistant Professor, Community Medicine,  
Community Based Medical College Bangladesh.
5. Dr. Sultana Sobnam Dipu  
Assistant Professor, Community Medicine,  
Community Based Medical College Bangladesh.
6. Dr. Sadiqa Tahera, Lecturer, Physiology,  
Dhaka Community Medical College.

\* Address of Correspondence:  
Email : ahmhasan1978@gmail.com  
Phone: 01715024128

cited in textbooks of medicine which needs early diagnosis and treatment (medical, surgical). In public health practice alcohol, steroid intake and oral contraceptives are important causes of hypertension. Hypertension is a risk factor for cardiovascular diseases and hypertension has also risk factors. The cardiovascular risks associated with blood pressure depend upon the combination of risk factors in an individual, such as age, gender, weight, physical activity, smoking, family history,

serum cholesterol, diabetes mellitus and pre-existing vascular disease. Important risk factors of hypertension are age, family history, diabetes, obesity, sedentary life style, added salt intake, smoking, steroid intake and oral contraceptive use. The risk factors of hypertension are largely modifiable and preventable.<sup>5, 10, 11</sup>

## Methods

This cross-sectional descriptive study was carried out from January 2015 to March 2016 in Churkhali and Winnerpar villages of 12 Bhavokhali union, Sadar upazila, Mymensingh. The sample size, study area and sampling technique was purposive. The sample size was 408. Informed consent was taken prior to interview. Data were collected on a pre-designed questionnaire by direct interviewing the respondents. Three blood pressure readings were taken in home setting with due time interval over 2 to 3 days and average of reading was recorded. Hypertension is defined as any one of the following: systolic blood pressure  $\geq$  140 mm Hg, diastolic blood pressure  $\geq$  90 mm Hg and known cases of hypertension. Persons who had systolic blood pressure 120-139 mm Hg, diastolic blood pressure 80-89 mm Hg were considered as pre-hypertensive. Height and weight of respondents were measured and BMI calculated. A computerized master sheet was prepared. Data were analyzed by Microsoft Excel and SPSS 16 version and presented in tables and figures.

## Results

Prevalence of hypertension (HTN) was (87/408) (21.32%); isolated systolic

hypertension (25/408) (6.13%), isolated diastolic hypertension (31/408) (7.60%), combined systolic and diastolic hypertension (31/408) (7.60%) and known hypertension with controlled blood pressure was nil. Among 87 cases 75 were new and 12 were old; 11 old cases on irregular treatment and 1 old case on regular treatment. Blood pressure was not under control among 12 old cases.

### Table-I shows blood pressure distribution of respondents

Status	Frequency	Percentage
Normal	138	33.82
Pre-HTN	183	44.85
HTN	87	21.32
Total	408	100.00

The respondents had age range from 18 yrs to 90 yrs. Mean age 39.22 yrs, standard deviation 14.81 yrs. Male: female ratio 39.25: 100. Table II shows age and sex distribution of respondents.

### Table-II: Age and sex distribution of respondents

Age	Sex		Total
	Male	Female	
15-24 yrs	17	40	57
25-34 yrs	16	106	122
35-44 yrs	25	57	82
45-54 yrs	21	50	71
55-64 yrs	27	23	50
65 yrs +	9	17	26
Total	115	293	408

Most of the males were farmers (35.65%) and most of the females were housewives (91.47%). Most of the respondents had normal BMI (69.85%), were physically active (79.17%). Most of them were married (92.89%), illiterate (52.70%), belonged to middle class (50.98%), nuclear family (49.26%); no family history of high blood pressure (76.23%), had positive history of added salt intake (66.42%) and consumption of smokeless tobacco (64.22%). Number of children per family was 2.88. (70%) had normal BMI, (8%) underweight, (20%) overweight and (2%) obese. Prevalence of diabetes was (3.19%), smoking (20.34%) and steroid intake (9.80%). Hypertension had increasing trend with advancing age which

peaks at (55-64 yrs) (42%) then it declines. Prevalence of HTN among 65 years and above was (34.62%); among 60 yrs and above was (46.30%). Male had more prevalence of HTN (27.83%) than females (18.77%). Male farmers had more prevalence (39.02%). Female working outside had higher prevalence (31.59%). Widow (28.57%), illiterate (25.58%), rich (33.33%), members of extended family (27.50%), more than 2 children (25.37%), family history of high blood pressure (37.11%), co-presence of diabetes (61.54%), BMI value 25 and above (43.96%), sedentary life style (29.41%), added salt intake (22.14%) smoking (33.73%), smokeless tobacco (25.95%), steroid intake (27.50%) were important risk factors for hypertension. Women of reproductive age group had lower prevalence (15.56%). OCP use in that age group was (48.42%) and OCP users had increased prevalence of hypertension (16.82%). (11.51%) of married female were pregnant, ankle edema (6.25%), pregnancy related hypertension (3.13%), ankle edema with hypertension was nil. Table III shows lifestyle factors influencing hypertension.

**Table-IV: Lifestyle factors influencing hypertension**

Lifestyle factors	Prevalence of hypertension
Sample prevalence	21.32
Sedentary lifestyle	29.41
Added salt intake	22.14
Smoking	33.73
Smokeless tobacco	25.95
Steroid	27.50
OCP among women of reproductive age group	16.82

**Table-IV shows demographic, socioeconomic and co-morbid conditions influencing hypertension.**

**Table-IV: Demographic, socioeconomic and co-morbid conditions influencing hypertension**

Demographic, socioeconomic and co-morbid conditions	Prevalence of Hypertension
Sample prevalence	21.32
Age 60 yrs and above	46.30
Male	27.83
Women of reproductive age group	15.56
Widow	28.57

Illiterate	25.58
Rich	33.33
Extended family	27.50
More than 2 children	25.37
Family history of high blood pressure	37.11
Diabetes	61.54
BMI 25 and above	43.96
Female working outside	31.59

**Discussion:** Churkhai is a village of 12 Bhabkhlai union. It has 1889 households with population of 8791. Winnerpar is also a village of 12 Bhabkhlai union with 883 households with 4694 population.<sup>12</sup> Sample size was 408. There were 115 males and 293 females i.e. most of the respondents were female as because most of the male were not present at residence at that time. Literacy rate was 47.30%. Population below poverty line was 48.28%. Literacy was similar to BBS survey (rural literacy 47.90%)<sup>13</sup> whereas poverty status was worse. Population below poverty line as per income expenditure of households in 2010 was 31.50 per cent<sup>14</sup>, has stood at 25.60 per cent<sup>15</sup> in June 2014.

Prevalence of hypertension was 21.32% which was better than text book cited prevalence (global 25%, 33.5% African American, 28.9% American whites)<sup>5, 10, 11</sup>, on-line data<sup>4</sup> on global prevalence 31.1% in 2010, developed countries<sup>16, 17</sup> (USA 29%, England 30%, Germany 55%) and developing countries<sup>18, 19, 20</sup> (Sri Lanka 30.4%, Nepal 32.5%, India 25.2%) and national prevalence<sup>21, 22</sup> (26.4%, 30.64%) but worse than Canada (19.5%)<sup>16</sup> and rural India (14.1%).<sup>23</sup>

Hypertension had increasing trend over age culminating at 55 to 64 yrs (42%) followed by decline by 65 yrs and above (34.62%); prevalence among respondents 60 yrs and above 46.30%. Prevalence of hypertension was more among males 27.83% than female 18.77% and this dominance was observed below 50 yrs: male 17.46%, female 15.56% and also 50 yrs and above: male 40.38%, female 29.41%. Male farmers had more prevalence of HTN 39.02% followed by service holders 38.88%. Females who work outside home had more prevalence of HTN

31.59% than housewife and dependent 17.88%. As per marital status widow had more prevalence of hypertension 28.57%. Those who had children more than 2 had more prevalence of HTN 25.37%. Hypertension was more prevalent among extended family 27.50%. Age is the single most risk factor for hypertension mentioned in text books<sup>5, 10, 11</sup> and also supported by almost all studies.<sup>8, 19-29</sup> In text book prevalence above 60 years 65.4%.<sup>5</sup> In high-income countries, the greatest absolute burden was in older age groups  $\geq$  60 years, whereas in low- and middle-income countries the greatest absolute burden was in the middle age groups (e. g, 40–59 years).<sup>4</sup> Before the age of 50 years, hypertension is less common in women than men and after menopause hypertension is more common in women than men.<sup>10</sup> In all WHO regions, men have slightly higher prevalence of raised blood pressure than women.<sup>3</sup> Prevalence of hypertension reported to be more in male in studies<sup>19, 22</sup> and more in female reported in studies<sup>9, 20, 21, 23, 24, 25, 26, 27, 29</sup>. Dhaka study conducted in Nilphamari showed occupation of male had no association with hypertension.<sup>22</sup> In a Bangladeshi study hypertension was more prevalent among working professionals of both sexes.<sup>9</sup> In a Nepali study<sup>19</sup> for both male and female those who work at home had higher prevalence of hypertension than those who work outside home. Separated or widow had more prevalence (50%) in comparison to married 34.3%, unmarried 11.8%. In an Indian study<sup>23</sup> retired persons and professionals had more prevalence. In Indian studies unemployed (31.51%, 31.3%) and unskilled persons (32.92%, 31.82%) had more prevalence of hypertension than professional (18.63%, 22.06%), semi-professional (21.05%, 20%) and skilled persons (18.72%, 17.07%).<sup>20, 26</sup> In an Ethiopian study<sup>27</sup> hypertension was more among housewives. A Ghana study found widowed/divorced/separated women had more prevalence (13.5%) than married or living together 9.7% and those who were never married 1.7% prevalence.<sup>28</sup> In Indian studies family size 6 and more had (40.48%, 41.07%) prevalence, compared to 5 and less (22.43%, 22.41%).<sup>23, 27</sup> In an Indian study

they have found joint family has higher risk of giving hypertension.<sup>29</sup>

In this study 6.25% of pregnant women had ankle edema, 3.13% of pregnant women had hypertension, all ankle edema cases had normal blood pressure. Hypertension is present in about 10% of all pregnancies.<sup>10</sup> We have not done urine analysis for detection of proteinuria. Ankle edema, proteinuria and hypertension constitute pre-eclampsia and when convulsion adds it is eclampsia. Pre-eclampsia and eclampsia are important causes of maternal mortality in Bangladesh. A BIRDEM study conducted in Nandail upazila, Mymensingh on 147 pregnant women found the crude prevalence of systolic and diastolic hypertension was 6.8 and 5.4% respectively.<sup>30</sup>

Hypertension was more prevalent among those who had family history of high blood pressure 37.11%, among illiterate 25.58% and rich 33.33%. High blood pressure before age 55 occurs 3.8 times more frequently among persons with a positive family history of hypertension<sup>7</sup>. Role of family history influencing higher prevalence of hypertension is cited in text books<sup>5, 10, 11</sup> and supported by studies.<sup>19, 22, 27, 29</sup> Hypertension is more among lower level of education is supported by Nepali study<sup>19</sup>, Ethiopian study<sup>27</sup> and Indian study<sup>23</sup> and among poor in Nepali study.<sup>19</sup> Hypertension is more among higher level of education is supported by Bangladeshi study<sup>21</sup>, Uganda study<sup>26</sup>, Ghana study<sup>28</sup> and among higher income groups by Dhaka study.<sup>22</sup> and Ghana study.<sup>28</sup>

HTN was more among those who had BMI 25 and above 43.96% and who were known cases of diabetes 61.54%; had sedentary lifestyle 29.41%, habit of added salt intake 22.14%, smokers 33.73%, the consumers of smokeless tobacco 25.95%, steroid users 27.50%. OCP use among women of reproductive age group was (107/225) (48.42%). HTN was more prevalent among OCP users 16.82% and more among those who use for longer duration: less than 1 year 7.14%, 1 year to 5 years 12.5% and more than 5 years 28.21%. 91.67% of the known

patients of hypertension were on irregular treatment. Blood pressure was not under control for 12 old cases. There was no alcoholic in our study. Role of BMI in increased prevalence of hypertension is cited in text books and supported by studies.<sup>18, 20, 21, 23, 24, 26, 27, 29</sup> In Indian studies prevalence of hypertension among obese were (44.03%, 44.83%) in comparison to non-obese (22.57%, 22.62%).<sup>20, 24</sup> Hypertension is present in 75% of diabetic patients.<sup>10</sup> In a Nepali study diabetes patients had 54% prevalence in comparison to non-diabetes 30% prevalence.<sup>19</sup> In Indian studies<sup>20, 24</sup> diabetes patients had (54.69%, 53.93%) prevalence in comparison to non-diabetes (21.32%, 21.33%). In a Bangladeshi study high BMI and having diabetes were associated with the increasing risk of hypertension.<sup>21</sup> Textbooks cite sedentary lifestyle as important contributor to increased prevalence of hypertension.<sup>5, 10, 11</sup> Regular physical activity facilitates weight loss, decreases blood pressure and reduces the overall risk of cardiovascular disease. Blood pressure may be lowered by 30 min of moderately intense physical activity, such as brisk walking 6-7 days a week or by more intense, less frequent workouts.<sup>5</sup> In a Nepali study<sup>19</sup> sufficient physical activity is linked with less prevalence of hypertension 30.4% in comparison to who are sedentary 40.2%. Dhaka study conducted in Nilphamari showed similar finding.<sup>22</sup> In the INTERSALT study of 52 locations around the world, the risk for development of hypertension during three decades of adult life was linearly and tightly related to dietary sodium intake.<sup>10</sup> Role of added salt intake influencing higher prevalence of hypertension is cited in text books<sup>5, 10, 11</sup> and supported by numerous studies. Role of smoking is mentioned in text books.<sup>5, 10, 11</sup> Because blood pressure increases transiently by 10 to 15 mm Hg after each cigarette, smokers of more than 20 cigarettes per day often have higher blood pressures.<sup>10</sup> In Indian studies and a Nepali study prevalence among smokers (39.33%, 40.34%, 42.7%) were more than non-smokers (22.46%, 22.35%, 30%).<sup>20, 24, 19</sup> In an Indian study<sup>23</sup> present tobacco use was linked with 17.9% prevalence than non-users 13.7%.

Dhaka study conducted in Jaldhaka found increased prevalence of hypertension among smokers.<sup>22</sup> In an Indian study tobacco chewers had 31.76% prevalence in comparison to non-tobacco chewers 23.59%. In Indian study chewers of tobacco for more than 5 years 33.3%, less than 5 years 31.6% in comparison to non-tobacco chewers (23.5%) prevalence of hypertension.<sup>20</sup> Anabolic steroids, corticosteroids are known causes of secondary hypertension.<sup>5, 10, 11</sup> Public health experts suggest clinicians to use steroids for justifiable reasons and to use for short duration as possible. Oral contraceptives containing estrogens are known causes of secondary hypertension.<sup>11</sup> In Indian studies<sup>20, 24</sup> prevalence of hypertension among OCP users (48.44%, 47.72%) were more in comparison to non-users (23.74%, 24.93%). In another Indian study the prevalence of hypertension was 66.6% among those who were taking oral contraceptive pills for more than 3 years and it was 46.3% among those taking the pills for less than 3 years.<sup>23</sup> In a Sri Lankan study of the known hypertensive patients, 19.5% were not on anti-hypertensive medication and only 32.1% were controlled.<sup>18</sup>

## Conclusion

Promoting and nurturing good health behavior, illness behavior and treatment behavior are essential for control of hypertension. We can reduce hypertension prevalence by changing our life style which includes dietary modification, physical activity and avoidance of risk factors. Hypertension is a lifelong disease. We should motivate people to continue lifelong treatment to avoid disastrous complications.

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