



Prevalence of Risk Factors and Comorbidities among Patients with Hypertension

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ABSTRACT:

Background: Hypertension is a major cause of premature death worldwide. An estimated 1.28 billion adults have hypertension and two-thirds of them living in low and middle income countries. **Objective:** This study was designed to find out the prevalence of hypertension among patients attending to a cardiologist and to determine the prevalence of comorbidities. **Methods:** This cross sectional study conducted among 1082 patients attending to a cardiologist of three private hospitals of Bangladesh during January 2022 to December 2022. **Results:** Mean age of the patients was 49.9±9.9 years. More than half (58.3%) of the patients were male. Prevalence of hypertension was found 47.0% among the patients with heart disease. Hypertension was found more prevalent (48.0%) among patients aged 41-60 years. This study found hypertension more in female (64.5%) than male (34.5%). Hypertension was also more prevalent in smokers (73.7%) than non-smokers (39.9%). Class I obesity was prevalent in 8.3% of hypertensive patients. Among the hypertensive patients 31.6% had diabetes mellitus. Dyslipidemia was prevalent in 55.8% of patients with hypertension. Ischemic heart disease was prevalent in 18.9% of hypertensive patients. **Conclusion:** Risk factors and comorbidities should be address to prevent further complications and adverse health outcomes of hypertension.

1. Introduction

Hypertension, commonly known as high blood pressure, is a significant global health issue. It refers to a condition in which the force of the blood against the walls of the arteries is consistently too high, which can lead to various health problems, including heart disease, stroke, and kidney disease. The prevalence of hypertension varies by region, age group, and other factors, but it is a widespread health concern. Hypertension is the cause of 37% of all strokes and of 18% of cases of myocardial infarction (MI) worldwide [1].

Comorbidities are the health conditions which someone may have in addition to the primary problem. Hypertension often coexists with various comorbidities. Comorbidity is a common and notable status concerning the increasing complexity of care associated with it. In developed countries, more than 50% of older adults have three or more chronic conditions [2] and more than 20% of all patients were Multi-morbid [3]. The prevalence of comorbidities among patients with hypertension can vary depending on factors such as age, gender, genetics,

lifestyle, and geographic location. Common comorbidities associated with hypertension include obesity, diabetes, dyslipidemia, cardiovascular disease, chronic kidney disease, metabolic syndrome, sleep apnea, smoking, stress, mental health disorders, aging and hyperthyroidism.

It is essential to recognize and manage these comorbidities in individuals with hypertension because they can further increase the risk of complications and adverse health outcomes. Lifestyle modifications, medications, and regular medical check-ups are often necessary to control hypertension and its associated comorbidities effectively. Healthcare providers typically develop individualized treatment plans based on the patient's specific medical history, risk factors, and overall health.

Management of several comorbidities demands more complex and careful strategies to ensure proper care. However the prevalence estimates of multiple comorbidities differed significantly among different studies [4], [5]. This study was designed to find out the



prevalence of hypertension among patients attending to cardiologist and to determine the prevalence of comorbidities among the patients who were hypertensive. The results of the study will help physicians to assess the magnitude of hypertension and comorbidities which will help to manage comorbidities effectively.

2. Methodology

This was a cross sectional descriptive type of observational study conducted among purposively selected 1082 patients who attended a cardiologist in the outpatient department (OPD) of three different private hospitals of Mymensingh and Tangail districts of Bangladesh during January 2022 to December 2022. Data were collected by face to face interview of the patients, clinical examinations and recording the findings of laboratory investigations using a semi-structured case record form. Data were analyzed by Statistical Package for Social Science (SPSS, version 22.0). Qualitative variables were summarized by percentage and quantitative variables were summarized by mean and standard deviation (SD).

3. Results

Socio-demographic characteristics

Subjects of the study were the patients attending to a cardiologist in the OPD of three private hospitals. Among 1082 patients 790 (73.0%) were in the age group of 41-60 years; 265 (24.5%) were in the age group of 21-40 years and 27 (2.5%) patients were in the age group of 60-80 years. Mean age of the patients was 49.93 years with a standard deviation of 9.876 years (Table 1). Out of 1082 patients more than half (631, 58.3%) were male and the rest (451, 41.7%) female (Figure 1).

Table 1. Age* of the respondents (n=1082)

Age group (years)	Frequency (n)	Percentage (%)
21-40	265	24.5
41-60	790	73.0
60-80	27	2.5
Total	1082	100.0

*Mean±SD=49.93±9.876 years

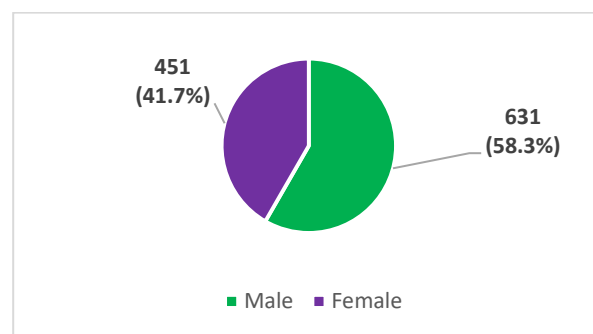


Figure 1. Gender of the respondents (n=1082)

Prevalence of hypertension

The subjects of this study attended to the cardiologist with different cardiac problems and comorbidities. Among the patients more than half (573, 53.0%) were normotensive and 509 (47.0%) were hypertensive. Prevalence of hypertension was found 47.0% among the patients with cardiac problems (Figure 2).

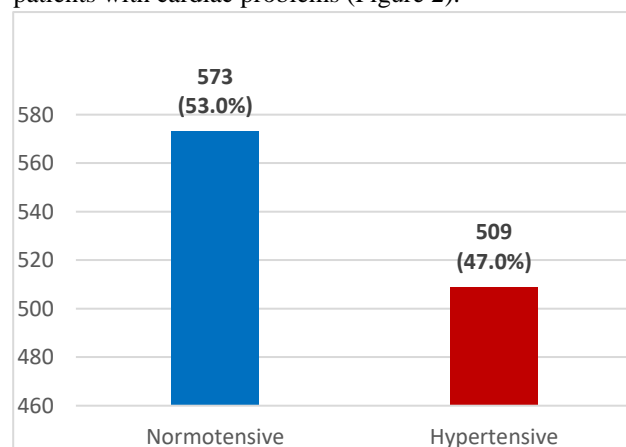


Figure 2. Prevalence of hypertension among the patients with cardiac problems (n=1082)

Prevalence of hypertension in different risk groups

In this study hypertension was found more prevalent (379, 48.0%) in the age group of 41-60 years followed by 123 (46.4%) in the age of 21-40 years and 7 (25.9%) between the age of 61 to 80 years ($p=0.076$) (Table 2). Hypertension was found significantly more prevalent in female (291, 64.5%) than male (218, 34.5%) ($p<0.001$) (Table 3). Hypertension was significantly more prevalent in smokers (168, 73.7%) than non-smokers (341, 39.9%) ($p<0.001$) (Table 4). Age 41-60 years, female sex and smoking might be considered as identified risk factors in this study. Hypertension was prevalent in 7 (8.3%) of class I obese patients (Table 5).

**Table 2.** Age of the patients with hypertension

Age group (years)	Hypertension		Total n (%)	p value (Chi-square test)
	Yes n (%)	No n (%)		
21-40	123 (46.4)	142 (53.6)	265 (100.0)	0.076
41-60	379 (48.0)	411 (52.0)	790 (100.0)	
61-80	7 (25.9)	20 (74.1)	27 (100.0)	
Total	509 (47.0)	573 (53.0)	1082 (100.0)	

Table 3. Gender of the patients with hypertension

Gender	Hypertension		Total n (%)	p value (Chi-square test)
	Yes n (%)	No n (%)		
Male	218 (34.5)	413 (65.5)	631 (100.0)	<0.001
Female	291 (64.5)	160 (35.5)	451 (100.0)	
Total	509 (47.0)	573 (53.0)	1082 (100.0)	

Table 4. Habit of smoking among patients with hypertension

Habit of smoking	Hypertension		Total n (%)	p value (Chi-square test)
	Yes n (%)	No n (%)		
Smoker	168 (73.7)	60 (26.3)	228 (100.0)	<0.001
Non-smoker	341 (39.9)	513 (60.1)	854 (100.0)	
Total	509 (47.0)	573 (53.0)	1082 (100.0)	

Table 5. Body Mass Index (BMI) of patients with hypertension (n=1082)

Body Mass Index (kg/m ²)	Hypertension		Total n (%)	p value (Chi-square test)
	Yes n (%)	No n (%)		

Underweight (<18.50)	167 (69.6)	73 (30.4)	240 (100.0)	<0.001
Normal (18.50-24.99)	191 (45.3)	231 (54.7)	422 (100.0)	
Pre-obese (25.00-29.99)	144 (42.9)	192 (57.1)	336 (100.0)	
Obese class I (30.00-34.99)	7 (8.3)	77 (91.7)	84 (100.0)	
Total	509 (47.0)	573 (53.0)	1082 (100.0)	

Prevalence of comorbidities among hypertensive patients

In this study 509 patients were hypertensive of whose 161 (31.6%) had diabetes mellitus (p=0.007) (Table 6). Dyslipidemia was prevalent in 284 (55.8%) of patients with hypertension (p<0.001) (Table 7). Ischemic heart disease was prevalent in 96 (18.9%) of hypertensive patients (<0.001) (Table 8).

Table 6. Diabetes among patients with hypertension (n=1082)

Diabetes	Hypertension		Total n (%)	p value (Chi-square test)
	Yes n (%)	No n (%)		
Yes	161 (31.6)	142 (28.8)	303 (28.0)	0.007
No	348 (68.4)	431 (75.2)	779 (72.0)	
Total	509 (100.0)	573 (100.0)	1082 (100.0)	

Table 7. Dyslipidemia among patients with hypertension (n=1082)

Dyslipidemia	Hypertension		Total n (%)	p value (Chi-square test)
	Yes n (%)	No n (%)		
Yes	284 (55.8)	75 (13.1)	359 (33.2)	<0.001
No	225 (44.2)	498 (86.9)	723 (68.8)	



Total	509 (100.0)	573 (100.0)	1082 (100.0)	
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Table 8. Ischemic Heart Disease (IHD) among patients with hypertension (n=1082)

IHD	Hypertension		Total n (%)	p value (Chi-square test)
	Yes n (%)	No n (%)		
Yes	96 (18.9)	164 (28.6)	260 (24.0)	<0.001
No	413 (81.1)	409 (71.4)	822 (76.0)	
Total	509 (100.0)	573 (100.0)	1082 (100.0)	

4. Discussion

Hypertension is considered as a threat to the health of human being because of its relation with several comorbidities. The study was aimed to explore the prevalence of hypertension among patients presented with cardiac problems and to find out the prevalence of comorbidities among hypertensive patients. Majority of the patients (73.0%) were in the age group of 41-60 years; 24.5% were in the age group of 21-40 years and 2.5% patients were in the age group of 60-80 years. Mean age of the patients was 49.93 years with a standard deviation of 9.876 years. Another hospital based study in Bangladesh found the median age of the patients as 52 years [6]. In this study more than half (58.3%) of the patients were male and the rest (41.7%) female. On the other hand the previously mentioned Bangladeshi study found more female (56.2%) in their study [6].

Among the patients more than half (53.0%) were normotensive and 47.0% were hypertensive. Prevalence of hypertension was found 47.0% among the patients with cardiac problems. In a study of China prevalence of hypertension in East zone was 35.36% [7]. In this study hypertension was found more prevalent (48.0%) in the age group of 41-60 years followed by 46.4% in the age group of 21-40 years and 25.9% between the ages of 61 to 80 years. The Chinese study found 56.69% among >60 years, 30.80% in 45-59 years and 12.51% in ≤44 years [7]. They found hypertension more prevalent in man (54%) than female (46%) [7]. On the contrary this study found hypertension significantly more in female (64.5%) than male (34.5%). Hypertension was significantly more prevalent in smokers (73.7%) than non-smokers (39.9%).

Age 41-60 years, female sex and smoking might be considered as identified risk factors in this study. Class I obesity was prevalent in 8.3% of hypertensive patients. On the other hand a Korean study found 60.1% prevalence of obesity among hypertensive patients [8]. Mannan et al. (2022) found obesity in 32.3% patients with hypertension [6].

In this study among the hypertensive patients 31.6% had diabetes mellitus. The Korean study found impaired fasting glucose in 45.1% hypertensive patients [8]. Mannan et al. (2022) found diabetes among 47.6% hypertensive patients [6]. Dyslipidemia was prevalent in 55.8% of patients with hypertension in this study while the Korean study found dyslipidemia in 57.6% hypertensive patients [8]. Ischemic heart disease was prevalent in 18.9% of hypertensive patients. Mannan et al. (2022) found ischemic heart disease in 16.2% of hypertensive patients [6].

5. Conclusion

Prevalence of hypertension was 47.0% among the patients with ischemic heart disease. Age 41-60 years, female sex and smoking might be considered as identified risk factors in this study. Diabetes, dyslipidemia and ischemic heart disease were the common comorbidities found in the study. Risk factors and comorbidities should be address to prevent further increase the risk of complications and adverse health outcomes.

References

1. J. V. Tu. Reducing the global burden of stroke: INTERSTROKE. *Lancet*, vol no. 376, pp 74-75, 2010.
2. Guiding principles for the care of older adults with multi-morbidity: an approach for clinicians. Guiding principles for the care of older adults with multi-morbidity: an approach for clinicians: American Geriatrics Society Expert Panel on the Care of Older Adults with Multi-morbidity. *J Am Geriatr Soc*, vol 60, pp E1-25, 2012.
3. K. Barnett, S. W. Mercer, M. Norbury, G. Watt, S. Wyke, B. Guthrie. Epidemiology of multimorbidity and implications for health care, research, and medical education: a cross-sectional study. *Lancet*, vol no. 380, pp 37-43, 2012.
4. M. Fortin, M. Stewart, M. E. Poitras, J. Almirall, H. Maddocks. A systematic review of prevalence



- studies on multimorbidity: toward a more uniform methodology. *Ann Fam Med*, vol no. 10, pp 132-151, 2012.
5. A. Marengoni, S. Angleman, R. Melis et al. Aging with multimorbidity: a systematic review of the literature. *Ageing Res Rev*, vol no. 10, pp 430-439, 2011.
 6. A. Mannan, K. M. Akter, F. Akter et al. Association between comorbidity and health-related quality of life in a hypertensive population: a hospital-based study in Bangladesh. *BMC Public Health*, vol no. 22, p 181, 2022. <https://doi.org/10.1186/s12889-022-12562-w>.
 7. J. Wang, J. J. Ma, J. Liu et al. Prevalence and Risk Factors of Comorbidities among Hypertensive Patients in China. *International Journal of Medical Sciences*, vol no. 14, issue no. 3, pp 201-212, 2017. doi: 10.7150/ijms.16974.
 8. J. Noh, H. C. Kim, A. Shin et al. Prevalence of Comorbidity among People with Hypertension: The Korea National Health and Nutrition Examination Survey 2007-2013. *Korean Circ J*, vol no. 46, issue no. 5, pp 672-680, 2016. <http://dx.doi.org/10.4070/kcj.2016.46.5.672>. Print ISSN 1738-5520 • On-line ISSN 1738-5555.