https://doi.org/10.3329/cbmj.v14i1.79351

Evaluation of Medication-Related Challenges in Hypertensive Patients: A Comprehensive Assessment at Community Based Medical College, Bangladesh (CBMC,B) Hospital

*Sattar S

Abstract

A cross-sectional, observational study was carried out at Community Based Medical College, Bangladesh (CBMC,B) Hospital, Mymensingh, Bangladesh, between January and September of 2023, to assess the proportion and nature of drug therapy problems, the regimen management of hypertension, and the associated risks among hypertensive patients. A total of 120 hypertensive patients willingly participated and responded to a structured questionnaire. Patient data include demographic characteristics, medications, clinical parameters, lifestyle factors, and drug therapy issues. The study included an equal distribution of males and females, with most patients aged 49-58 years (29.2%). Telmisartan (62.5%) and amlodipine (50.0%) were the most commonly prescribed medications. Among drug therapy problems (DTPs), need for monitoring (35%) and potential drug interactions (31.67%) were found most significant. Diabetes mellitus (37.50%) and chronic kidney disease (25.83%) were main comorbidities. Stress (50%) and unhealthy diet (49.17%) emerged as leading risk factors, while polypharmacy (55%) and comorbidities (53.33%) in patients emerged as main clinical challenges. This study suggests that medication review processes need to be well structured, resources required for improving the patients' knowledge about hypertension and its treatments are necessary for healthcare organizations in the country and monitoring activities ought to be conducted from time to time to review the management of hypertension.

CBMJ 2025 January: Vol. 14 No. 01 P: 128-133

Keywords: Hypertension, drug therapy problems, antihypertensive drugs, risk factors, comorbidity

Introduction

Hypertension acts as one of the most escalating global health problems in the twenty-first century, costing an estimated 1.28 billion adults, and acts as a precursor to cardiovascular diseases, stroke, and early mortality.[1] This asymptomatic chronic disease, known as the "silent killer," requires regular and adequate drug therapy to avoid critical outcomes and organ dysfunction. Nevertheless, hypertension therapy management always raises numerous and multifaceted drug therapy problems (DTPs) that may hamper patient outcomes and healthcare delivery.[2] Pharmacotherapy management-related issues include a wide range of clinical issues that occur during drug therapy and are described as any unwanted occurrence or situation that affects an individual's drug-related health outcomes.[3] These problems appear in many different guises and include selection of incorrect drugs, poor dosing regimens, adverse drug reactions, drug-pharmacophore interactions or contraindications, and medication non-compliance. The detection, implementation, and control of DTPs stand out as vital in long-term illnesses such as hypertension, in which drug administration forms the overall treatment regimen.[4] Hypertension remains a major challenge around the globe, and worse in the developing countries. This increase is a result of factors such as growth of cities, increase in

*Dr. Shamima Sattar, Associate Professor, Department of Pharmacology and Therapeutics, Community Based Medical College Hospital Bangladesh, Mymeisngh.

Address of Correspondence:
Email: shamimacbmcb@gmail.com

median age, change of diet patterns, and more recent and energy imbalance.[5]

In Bangladesh, there is a big challenge and constraints in managing hypertensive patients, probably due to poor resources, differences in health care accessibility, a heterogeneous population, and fewer pharmaceutical care services to offer.[6] The epidemiological research done in the past few years suggests a worrisome figure: hypertension is prevalent in 17% to 25% of Bangladeshi adults, and it is high time that we call attention to better management approaches.[7] Several factors inherent to developing healthcare systems add a level of difficulty to the management of hypertension. Participants also indicated key barriers such as a scarcity of healthcare personnel, a restricted number of health education materials, financial struggles that influence drug affordability, and non-uniformity of health literacy among the populace. Furthermore, the use of multiple medications, multiple coexisting diseases, and multiple therapeutic management plans in a single patient seems to complicate the possibility of DTP occurrence at every turn. Knowledge becomes important in tracking the trends, rates, and characteristics of DTPs in hypertensive patients in order to design specific prevention methods and enhance patients' conditions.[8]

This study aims to conduct a comprehensive evaluation of drug therapy problems (DTPs) among hypertensive patients in Bangladesh, focusing on three key aspects: the epidemiology of DTPs, the extent of medication use, and the factors promoting potential therapeutic adverse effects. By considering these elements, the results of this study will be able to gather useful information to promote the improvement of hypertension care and to develop evidence-based strategies for minimizing DTPs in our hospital as well as in other related healthcare facilities.

Methods

This cross-sectional, observational study was carried out at Community Based Medical College, Bangladesh (CBMC,B) Hospital, Mymensingh, Bangladesh, between January and September of 2023. This study population was all adult patients (≥18 years) diagnosed with hypertension. However, the inclusion criteria were patients currently receiving antihypertensive medication attending both outpatient and inpatient departments of the hospital, with or without comorbidities like diabetes mellitus (DM), chronic kidney disease (CKD), etc. The exclusion criteria were: patients with psychiatric conditions, pregnant women with pregnancy-induced hypertension, patients who were unable to communicate effectively and unwilling to participate in the study. Based on inclusion and exclusion criteria, a total of 120 hypertensive patients (60 males and 60 females) were selected for this study. A structured questionnaire in a patient data sheet was used as study tool. Information gathered included demographic details, medications, past medical history, lifestyle parameters, drug-related issues, and therapeutic outcomes to create a comprehensive patient profile using written questionnaires supplemented with patients' case record forms. Data was analyzed using descriptive statistics, with results presented as frequencies and percentages. Ethical clearance was obtained from the Ethical Review Committee of Community Based Medical College, Bangladesh (CBMC,B), Mymensingh, Bangladesh.

Results

A total of 120 patients were analyzed in this study, with an equal distribution of males (50%) and females (50%). The age distribution showed that patients in the 49-58 years age group were most affected (29.2%), followed by the 39-48 years age group (23.3%), which suggests that middle-aged adults are particularly vulnerable to developing hypertension (Table-I).

Table-I: Demographics characteristics of the participants (N=120)

Variables	Frequency	Percentage
Age Group (in years)		
18-28	10	8.3
29-38	8	6.7
39-48	28	23.3
49-58	35	29.2
59-68	20	16.7%
≥69	17	14.2
Sex		
Male	60	50
Female	60	50

Telmisartan, an angiotensin II receptor blocker, was the most frequently prescribed medication (62.5%), followed by amlodipine, a calcium channel blocker (50%). Among diuretics, torsemide (19.2%), furosemide (16.7%), and hydrochlorothiazide (13.3%) were commonly prescribed. Beta-blockers like metoprolol (12.5%) were less frequently used, while medications such as minoxidil (1.7%) and labetalol were prescribed least often (1.7%) (Table-II). Analysis of prescription patterns revealed that dual therapy was the most common (n=55), followed by monotherapy (n=35), and triple therapy (n=16) (Table-III). The majority of medications were administered orally, with telmisartan (75 patients) and amlodipine (60 patients) being the most common oral medications. Intravenous administration was limited primarily to diuretics, with furosemide (12 patients) and torsemide (5 patients) (Table-IV).

Table-II: Categories of drugs used as anti-hypertensive therapy (N=120)

Categories of drugs	Name of drugs	Frequency	Percentage
Calcium channel blocker	Amlodipine	60	50.0
	Nifedipine	7	5.8
Beta blocker	Metoprolol	15	12.5
	Atenolol	5	4.2
	Labetalol	2	1.7
Diuretics	Furosemide	20	16.7
	Torsemide	23	19.2
	Hydrochlorothiazide	16	13.3
	Spironolactone	5	4.2
Angiotensin II blocker	Telmisartan	75	62.5
Alpha plus beta blocker	Minoxidil	2	1.7
Alpha agonist	Clonidine	3	2.5

Table-III: Number of antihypertensive medications in prescription (N=120)

Number of medications	Number of prescriptions
One medication	35
Two medications	55
Three medications	16

Table-IV: Route of administration of antihypertensive drugs (N=120)

Drug	Route of administration	Number of patients
Telmisartan	Oral	75
Amlodipine	Oral	60
Torsemide	Oral	25
Furosemide	IV	12
Torsemide	IV	5

Several DTPs were identified, with need for monitoring (35.0%) and potential drug interactions (31.67%) being the most prevalent issues. Medication adherence problems were

observed in 21.67% of cases. Other significant DTPs included untreated indications (8.33%) and adverse drug reactions (6.67%) (Table-V).

Table-V: Drug therapy problems (DTPs) (N=120)

Drug therapy problems (DTPs)	Frequency	Percentage
Untreated indication	10	8.33
Inappropriate drug selection	2	1.67
Failure to receive medication	7	5.83
Overdose	6	5.0
ADR	8	6.67
Drug-drug interaction	3	2.50
Potential interaction	38	31.67
Drug not indicated or drug duplication	4	3.33
Lack of medication adherence	26	21.67
Prescription error	5	4.17
Need for additional drug	6	5.0
Need for monitoring	42	35.0

Stress (50%) and unhealthy diet (49.17%) emerged as leading risk factors, followed by Obesity (35%), lack of physical exercise (35%), and sleep disorder (34.17%) (Table-VI). Polypharmacy (55%) and comorbidities (53.33%) emerged as main clinical challenges (Table-VII).

Table-VI: Risk factors (N=120)

Risk factors	Frequency	Percentage
Genetics	8	6.67
Smoking	33	27.50
Alcohol	14	11.67
Lack of physical activity	42	35.0
Stress	60	50.0
Sleep disorder	41	34.17
Unhealthy diet	59	49.17
Obesity	42	35.0

Table-VII: Clinical challenges (N=120)

Clinical challenge	Frequency	Percentage
Polypharmacy	66	55.0
Uncontrolled blood pressure	27	22.50
Comorbidity	64	53.33

Comorbidity analysis revealed that 54.17% of patients had one comorbid condition, with diabetes mellitus (37.50%) and chronic kidney disease (25.83%) being the most common. Treatment duration exceeded one week in 50% of cases. Among lifestyle factors, lack of exercise (34.17%) and high-salt diet (31.67%) were prominent (Table-VIII).

Table-VIII: Clinical characteristics of comorbidities among hypertensive patients (N=120)

Variables	Frequency	Percentage
Number of comorbidities		
One	65	54.17
Two	15	12.50
More than two	9	7.50
None	20	16.67
Types of comorbidities		
Diabetes mellitus	45	37.50
CKD	31	25.83
Others	14	11.67
Duration of treatment		
Less than 1 week	48	40.0
More than 1 week	60	50.0
Lifestyle factors		
Alcohol	15	12.50
Exercise	41	34.17
Salt diet	38	31.67
Smoking	32	26.67

Discussion

Based on the study population with males and females in equal proportion 50/50, no sex dominance is normally reported to have suggest enhancement of woman's health care facility in urban Bangladesh. The peak age group in this study is the 49-58 years age group in sync with other regional studies; but significantly higher 8.3% prevalence in the 8-27 years age group is much higher than reported 3-5% in young adults across South Asia.[7] This study revealed 157 DTPs among 120 patents, comparing to similar

studies such as Abu Ruz *et al.*[9], as they found 66 DTPs among 193 patients. Similar observations were reported by Azizah & Khairunnisa.[10] This increased prevalence may be due to the difficulty in controlling hypertension in this setting, needs due to factors such as limited resources, and responding to different types of population. The non-adherence in this study is 21.67%, while the global data of low- and middle-income countries range between 27% and 40%.[11] The reason behind would be that the degree of adherence in this study was relatively better than others, particularly due to our urban population and the use of frequent follow-up systems; however, the non-adherence issue remains usual. Furthermore, there was a 31.67% of the potential drug interactions, a potential drug interaction rate higher than the rate of 20%-25% as documented by Sepehri *et al.*[12] In terms of antihypertensive medication, study findings showed a distinct prescribing pattern compared to international studies: for example, telmisartan was prescribed in 62.5% of cases, while in European trials the range was only 40-45%[13], amlodipine was used in 50% of cases, whereas in the US trials, it varied from 35%-40%.[14] Comorbidity among hypertensive patients reported here are higher: diabetes mellitus was identified in 37.5% of patients, who were compared to 25–30% of patients in other regional studies, and chronic kidney disease, diagnosed in 25.8% of patients, is higher than the rate of 15-20% as reported by the previous studies.[1,6] Furthermore, 35% of patients in this study needed further control, as evidenced by a Southeast Asian study, which point to a need for control in 30%-40% of cases.[15] On the risk factors, stress score reached 50% and unhealthy diet score was 49.17%, which was accompanied by a higher stress level than those appearing in the western studies (30-35%) and lower physical inactivity rates in comparison to the regional means.[16] Polypharmacy and potentially inappropriate medications (PIMs) have been a long-standing problem in our country especially among elderly population[17], which was also reflected in this study. As a result, we established several important areas for improvement in our healthcare like introduction of systematic medication reviewing processes that have been described to be effective in similar situations, as well as the creation of electronic health records that have been successfully developed in other LMICs.[16]

Conclusion

This research pinpoints major difficulties in controlling hypertension in Bangladesh, such as medicine supervision, interference of the applied drugs, and compliance. The combined research identifies the importance of engaging medication review procedures on a systematic basis, establishing better patient education programmes, monitoring schedules and developing methods to handle modifiable risk aspects connected with lifestyles. The findings may enhance the knowledge and usable values of DTPs in the management of hypertensive disorder considerably in resource-restricted zones. An attempt is made to compare the results obtained by pointing to the common threats and dangers, as well as local factors that require reconsideration in the development of strategies for managing hypertension. The findings can be helpful to clinicians and policy makers in planning focused interventions of patients with hypertension and reduce the impact of DTPs in similar healthcare facilities.

References

1. *Ghosh PK, Harun MGD, Shanta IS, Islam A, Jannat KKE, Mannan H. Prevalence and determinants of hypertension among older adults: A comparative analysis of the 6th and 8th national health surveys of Bangladesh. PLoS One. 2023;18(10):e0292989.*
2. *Kapoor A, Aluminium MA, Manger S, Usman I, Sada M, Akhter MS, et al. Assessment of drug therapy problems among hypertensive patients at integral institute of medical science and research. Int J Basic Clin Pharmacol. 2024;13(5):663-8.*
3. *Tiwari D, Islam SS, Khan MM. Correlation of serum copper, magnesium, and zinc in essential hypertension. Biochem Cell Arch. 2019;19(1):1051-6.*
4. *Hasan MJ. Pattern of drugs prescribed for treatment of hypertensive patients: Bangladesh. Afr J Pharma Pharmacol. 2016;10(25):521-5.*
5. *Roy U, Razon AH, Ahmad T, Barsha TS. Prevalence of hypertension and its associated risk factors during COVID-19 pandemic in the capital of Bangladesh. Hum Nutr Metab. 2024;38:200289.*
6. *Hossain M, Uddin N, Islam A, Akash R, Hasan M, Saha T, et al. Survey of hypertension in Dhaka, Bangladesh: changing prescribing patterns. Trop J Pharma Res. 2015;14(2):329.*
7. *Chowdhury MZI, Rahman M, Akter T, Akhter T, Ahmed A, Shovon MA, et al. Hypertension prevalence and its trend in Bangladesh: evidence from a systematic review and meta-analysis. Clin Hypertens. 2020;26:10.*
8. *Nematullah M, Parveen R, Singh R, Kumar R. Pharmacoeconomics evaluation of telmisartan as monotherapy compared with telmisartan plus hydrochlorothiazide as combination therapy in hypertensive patients. World J Pharma Pharma Sci. 2020;9(2):1419-25.*
9. *Abu Ruz SM, Bulatova NR, Yousef AM, Al-Ghazawi MA, Alawwa IA, Al-Saleh A. Comprehensive assessment of treatment-related problems in hospitalized medicine patients in Jordan. Int J Clin Pharma. 2011;33(3):501-11.*
10. *Azizah N, Khairunnisa HR. Drug therapy problems in management of hypertensive outpatients admitted to four Indonesian primary health centers. Asian J Pharma Clin Res. 2016;9(1):87-90.*
11. *Azharuddin M, Adil M, Sharma M, Gyawali B. A systematic review and meta-analysis of non-adherence to anti-diabetic medication: Evidence from low- and middle-income countries. Int J Clin Pract. 2021;75(11):e14717.*
12. *Sepehri G, Khazaelli P, Dahooie FA, Sepehri E, Dehghani MR. Prevalence of potential drug interactions in an Iranian general hospital. Indian J Pharm Sci. 2012;74(1):75-9.*
13. *Kjeldsen SE, Schumacher H, Neldam S, Guthrie RM. Telmisartan/Hydrochlorothiazide combination therapy for the treatment of hypertension: a pooled analysis in older and younger patients. J Clin Hypertens. 2013;15(6):380-8.*
14. *Wang JG, Palmer BF, Vogel Anderson K, Sever P. Amlodipine in the current management of hypertension. J Clin Hypertens. 2023 Sep;25(9):801-7.*
15. *IMARC Group. Southeast Asia Remote Patient Monitoring Market Report by Device Type (Blood Pressure Monitor, Glucose Monitor, Heart Rate Monitor, Pulse Oximeters, Respiratory Monitor, and Others), Application (Cancer Treatment, Cardiovascular Diseases Treatment and Monitoring, Diabetes Treatment, Sleep Disorder Treatment, Weight Management and Fitness Monitoring, and Others), End Use (Hospitals and Clinics, Homecare Settings, and Others), and Country 2024-2032. Report ID: SR112025A19813. 2024. Retrieved from: https://www.imarcgroup.com/southeast-asia-remote-patient-monitoring-market (Accessed September 19, 2024).*
16. *Carollo M, Boccardi V, Crisafulli S, Conti V, Gnerre P, Miozzo S, et al. Medication review and deprescribing in different healthcare settings: a position statement from an Italian scientific consortium. Aging Clin Exp Res. 2024;36(1):63.*
17. *Khan SJ, Sultana A, Tanira S, Asaduzzaman M, Nahar K, Fatema SK, et al. Potentially inappropriate medications identified using Beers criteria prescribed to geriatric patients in an outpatient department of a tertiary care hospital in Bangladesh. Mugda Med Coll J. 2024;7(2):71-5.*