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Original Research Article

A study of drug utilization pattern in patients with hypertension in a tertiary care hospital

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ABSTRACT

Background: Hypertension, a leading global health concern, poses significant risks to vital organs such as the heart, brain, and kidneys. Effective management remains a challenge, especially in countries like India, where cardiovascular diseases are a major contributor to mortality. This study aimed to evaluate the drug utilization patterns of antihypertensive drugs and associated prescribing practices in a tertiary care teaching hospital.

Methods: A hospital-based cross-sectional descriptive study was conducted from January to October 2023 in the Departments of Medicine and Cardiology. The study included patients diagnosed with hypertension aged 18 years or older. Data on prescribed antihypertensive drugs, including drug type, dosage and comorbidities, were collected and analyzed.

Results: A total of 230 prescriptions were analyzed, with 75.59% of patients receiving monotherapy. Amlodipine was the most commonly prescribed drug, used in 87.5% of monotherapy cases. Combination therapies were prescribed to 24.41% of patients, with the most common combinations being Amlodipine + Atenolol and Losartan + Hydrochlorothiazide + Amlodipine. Diabetes mellitus was the most frequent comorbidity observed, affecting 60 patients. A significant portion of prescriptions (59%) was written using brand names, and 41% were written using generic names.

Conclusion: Future research should focus on enhancing patient adherence, optimizing treatment regimens, and continuously monitoring prescribing patterns to improve hypertension management and reduce associated health burdens.

Keywords: Hypertension, Antihypertensive drugs, Prescription patterns, Monotherapy, Combination therapy

INTRODUCTION

Hypertension is a major health issue with significant risks to vital organs such as the heart, brain, and kidneys.¹ Current global estimates indicate that a substantial portion of the adult population is affected by this condition, with many individuals unaware of their hypertension status.² Effectively managing and controlling hypertension remains a challenge, as only a small percentage of those affected achieve optimal blood pressure control.² In countries like India, non-communicable diseases, particularly cardiovascular diseases, contribute

significantly to mortality rates, especially among middle-aged adults.³ The impact of hypertension extends beyond individual health, placing a strain on public health systems and economies due to increased morbidity, mortality, and healthcare costs. The condition's prevalence continues to rise, earning it the label "silent killer" due to its often-asymptomatic nature.⁴ The presence of coexisting conditions such as diabetes or high cholesterol further complicates treatment strategies and drives up costs.⁵ Treatment approaches have evolved, with various international guidelines offering differing recommendations. Drug choices vary based on the specific

case and regional guidelines.⁶ The evolving nature of treatment guidelines and the introduction of new drugs highlight the need for continuous evaluation of prescription patterns. Drug utilization studies are essential for assessing the social, medical, and economic impacts of various treatments, with the goal of promoting rational prescribing practices.⁷ This study aims to assess the prescription patterns of antihypertensive drugs among patients in the Departments of Medicine and Cardiology at a tertiary care teaching hospital from January 2023 to October 2023.

METHODS

Study type

This hospital-based cross-sectional descriptive study.

Study place

The study was conducted in Medicine and Cardiology Department, NEIGRIHMS, Shillong.

Study duration

The study was conducted over 10 months, from January to October 2023.

Inclusion criteria

It aimed to assess the pattern of drug use and Inclusion criteria included patients diagnosed with hypertension, aged 18 years or older, and willing to provide informed consent.

Exclusion criteria

Exclusion criteria were patients with eclampsia, terminal illnesses, those under 18 years, and those requiring cardiac interventions.

Ethical approval

The study began after approval from the Institutional Ethics Committee (IEC). Patients who met the inclusion criteria provided written informed consent before participation.

Relevant data on prescribed antihypertensive medications, including formulation, dosage, administration details, comorbidities, and concurrent medications, were recorded in the case record form.

RESULTS

A total of 230 prescriptions were analysed during the study. One key observation was that every prescription included recommendations for lifestyle modifications, regardless of the antihypertensive medication prescribed to the patients.

This emphasizes the importance of lifestyle changes in the management of hypertension. Additionally, all the recorded prescriptions indicated that the antihypertensive drugs were administered orally, highlighting the common method of administration for these medications in the studied cohort.

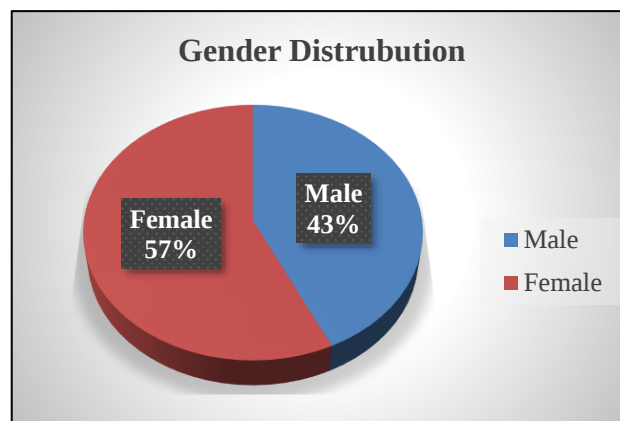


Figure 1: Demographic status of patients.

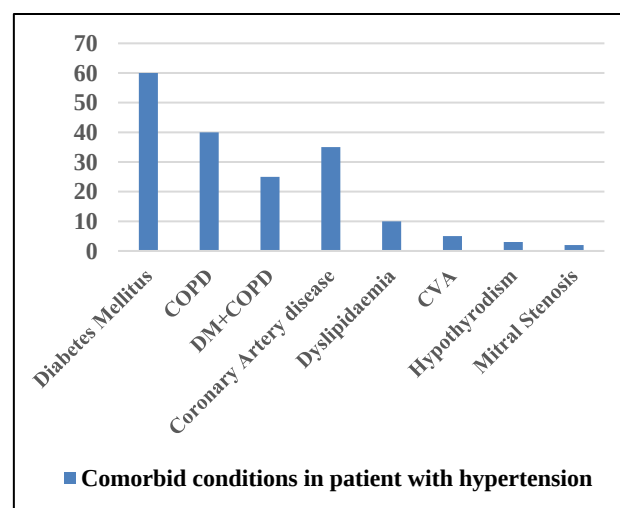


Figure 2: Distribution of prescriptions with comorbid conditions in patients with hypertension.

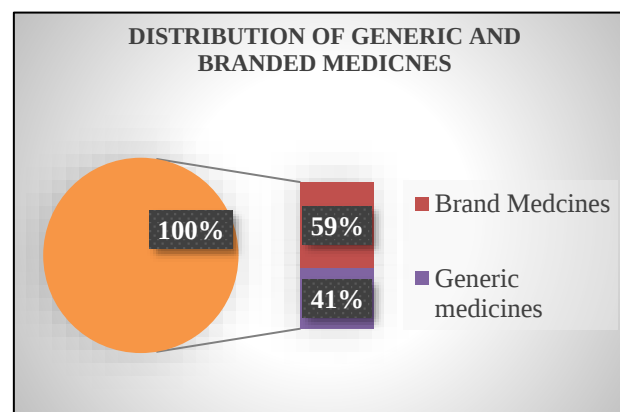


Figure 3: Distribution of generic and brand medicines.

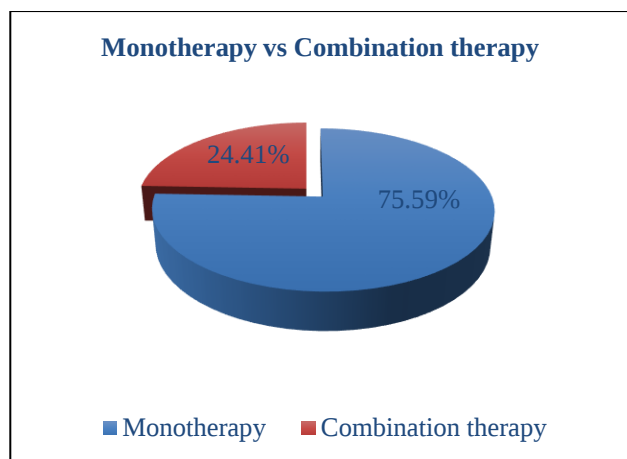


Figure 4: Distribution of patients receiving monotherapy and combination drug therapy of antihypertensive drugs.

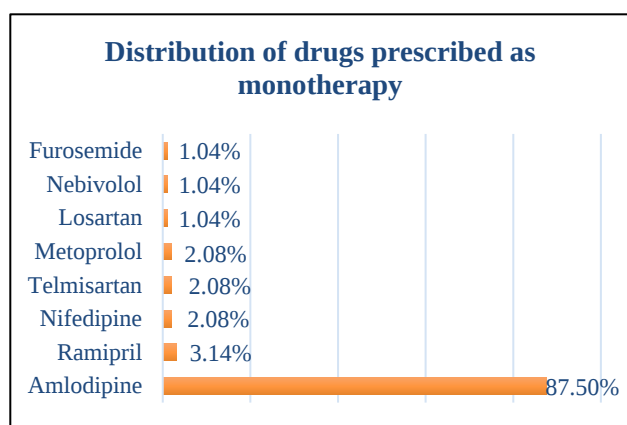


Figure 5: Distribution of drugs prescribed as monotherapy.

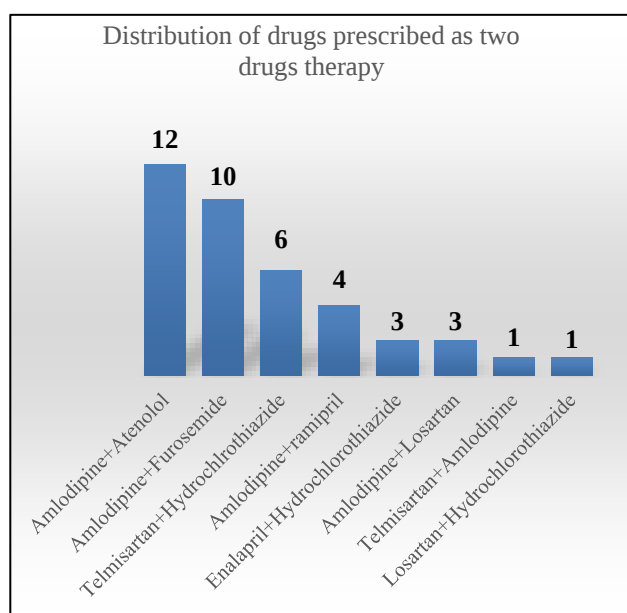


Figure 6: Distribution of drugs prescribed as two drugs therapy.

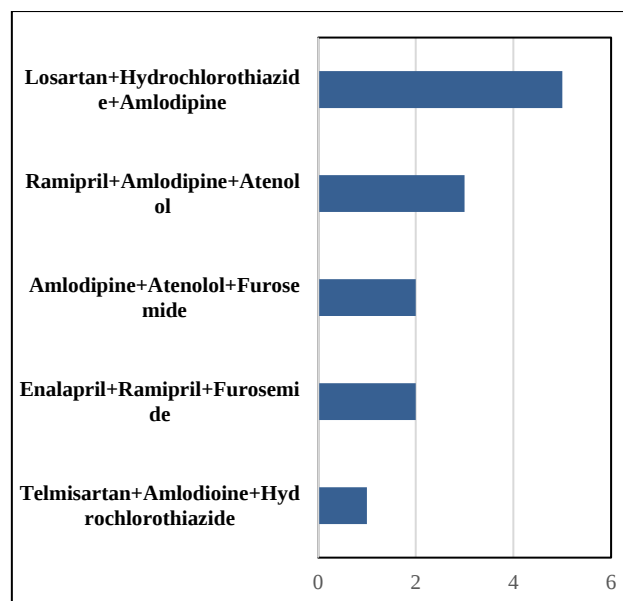


Figure 7: Distribution of drugs prescribed as three drugs therapy.

As presented in Table 1, majority of patients (34.7%) were in the age group of 61-70 years, followed by those in the 51-60 years age group (26%) and 71-80 years age group (15.3%). Figure 1 shows, out of 230 patients 130 were female (57%) and 100 were male (43%).

Figure 2 illustrates the distribution of prescriptions among patients with hypertension and comorbid conditions. It was observed that diabetes mellitus (60 patients) was the most common comorbidity, followed by COPD (chronic obstructive pulmonary disease)-40 patients, and then coronary artery disease (35 patients). As illustrated in Figure 3, 59% of the prescriptions were written using brand names, while 41% were prescribed using generic names. As shown in Table 2, Amlodipine was the most commonly prescribed generic medication, with 35 prescriptions, followed by Atenolol with 20 prescriptions. Table 3 presents the distribution of prescriptions by brand names, with Avacard (Amlodipine) being the most frequently prescribed generic medicine (40 prescriptions), followed by starpress XL (metoprolol) with 18 prescriptions. In this study, a total of 230 prescriptions for antihypertensive drugs were analyzed. Of these, 174 prescriptions (75.59%) were for monotherapy, while 56 prescriptions (24.41%) were for combination therapy. In the present study, 174 patients (75.59%) were prescribed a single drug for hypertension treatment. The most frequently prescribed medication was amlodipine, which was given to 141 patients (87.5%).

As shown in Figure 6, out of 230 patients, 40 patients (17.32%) were prescribed a combination of two antihypertensive drugs. The most commonly prescribed two-drug combination was amlodipine + atenolol (12 patients). other two-drug combinations included amlodipine+ furosemide (10) and telmisartan+

hydrochlorothiazide (6). As shown in Figure 7, among 230 prescriptions, 13 patients (5.51%) were prescribed a combination of three antihypertensive drugs. The most commonly prescribed three-drug combination was losartan +hydrochlorothiazide+ amlodipine (5 patients). other three-drug combinations included ramipril+ amlodipine+atenolol (3) and amlodipine +atenolol+ furosemide (2).

The four-drug combination were the least prescribed, with only 3 patient (1.58%) receiving them. The combination prescribed were telmisartan+ hydrochlorothiazide+ amlodipine+ atenolol in 2 patients and telmisartan+ hydrochlorothiazide+ amlodipine+ metoprolol in 1 patient.

Table 1: Age distribution of patients.

Age (in years)	Number of patients	%
20–30	5	2.17
31–40	15	6.52
41–50	30	13.04
51–60	60	26
61–70	80	34.7
71–80	35	15.3
81–90	5	2.7

Table 2: Breakdown distribution of prescriptions with generic names.

Type of prescription	Drug name	Number of prescriptions
Generic medicines	Amlodipine	35
	Atenolol	20
	Furosemide	15
	Losartan	13
	Ramipril	12
Total prescriptions		95

Table 3: Breakdown distribution of prescriptions with brand names.

Prescriptions	Brand names	Frequency
Brand name medicines	Avacard (amlodipine)	40
	Starpress XL (metoprolol)	18
	Ramitorva (ramipril + atorvastatin + aspirin)	12
	Nicardia R (nifedipine)	14
	Nebistar (nebivolol)	11
	Telmikind (telmisartan)	11
	Lasix (furosemide)	9
	Envas H (enalapril +hydrochlorothiazide)	8
	Losar H (losartan +hydrochlorothiazide)	7
	Cardivas+ ramipril (carvedilol+ ramipril)	5
Total prescriptions		135

DISCUSSION

In this study, antihypertensive drugs prescribed in the department of medicine and cardiology were analyzed for drug utilization patterns. The gender distribution in our study was 43% male and 57% female, which is comparable to Khurshid et al's study, though with a slightly higher percentage of females.⁸ Our findings indicate that women are more likely than men to suffer from hypertension, although premenopausal women have a significantly lower risk of hypertension compared to men.⁹ While Tiwari et al,

reported the most affected age group as 50 to 60 years, our study showed that hypertension was most prevalent among patients aged 61 to 70 years.⁹ Consistent with studies by Bhardwaj et al and Pai et al, 75.59% of the patients in our study were prescribed antihypertensive medications as monotherapy.^{10,11} Etuk et al also reported a high frequency of two-drug combinations.¹² This variation is often due to the physician's treatment decisions, which take into account factors such as patient characteristics, comorbidities, and medication availability.¹²

In our study, amlodipine was the most commonly prescribed drug as monotherapy. CCBs are cost-effective and have minimal to no metabolic side effects, making them particularly suitable for patients with both hypertension and diabetes. This could explain their high prescription rates in our study.

The DUS of antihypertensive medications by Maduram et al and John et al similarly found amlodipine to be the most frequently prescribed drug.^{13,14} CCBs are also recommended for patients with both hypertension and diabetes mellitus. Furthermore, their natriuretic activity reduces the need for diuretics, enhancing patient compliance.

In line with Joshi et al's study, it was found that the most commonly prescribed two-drug combination in our study was amlodipine+ atenolol, this combination may reflect the enhanced efficacy of amlodipine when combined with β -blockers.⁴ Combination therapy can lower medication costs and improve patient adherence. Kousalya et al reported that enalapril+ amlodipine+ hydrochlorothiazide was the most frequently prescribed three-drug combination, while our study found losartan+ hydrochlorothiazide+ amlodipine to be the most common three-drug combination.¹⁵ Bhardwaj et al, found that none of the patients in their study required three-drug therapy, which is consistent with our findings, where monotherapy was more common than combination therapy.¹⁰ However, Janagan et al observed that combination therapy was more prevalent than monotherapy in their study.⁹

Regarding the type of medication prescribed, 59% of patients received antihypertensive drugs under brand names, while 41% were prescribed generic medications. Prescribing medications by their generic names and following rational drug prescribing practices are key strategies to reduce medication costs for patients while ensuring optimal hypertension control and maintaining high standards of care.¹⁶

Our study also found that comorbid conditions were prevalent among hypertensive patients. COPD was present in 17.3% of patients, while diabetes mellitus, the most common comorbid condition, was found in 26% of patients. Other comorbidities included hypothyroidism, coronary artery disease (CAD), dyslipidemia, cerebrovascular accident (CVA), and mitral stenosis.

CONCLUSION

The findings emphasize the importance of personalized treatment regimens, considering patient-specific factors such as comorbidities and adherence challenges. Future research should focus on strategies to enhance patient adherence and optimize dosage schedules to improve hypertension management. Continuous monitoring of treatment outcomes and prescribing patterns is essential to identify emerging trends and address gaps in care. Ultimately, this study highlights the potential to improve

hypertension management and reduce its burden by refining prescribing practices and addressing factors influencing adherence and treatment outcomes.

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Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

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