Section: Pharmacology

Original Research Article

PRESCRIPTION PATTERN ANALYSIS OF ANTIHYPERTENSIVE DRUGS IN A TERTIARY CARE TEACHING HOSPITAL: A PROSPECTIVE OBSERVATIONAL STUDY

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ABSTRACT

Background: Hypertension is a major public health concern globally and its effective management requires rational use of antihypertensive medications. Understanding prescribing patterns helps in identifying gaps and optimizing treatment strategies. Objectives: To analyze the prescription patterns of antihypertensive drugs among hypertensive patients attending a tertiary care teaching hospital. **Material and Methods:** A prospective observational study was conducted on 100 hypertensive patients attending the outpatient department of a tertiary care hospital. Demographic details, co-morbidities, and prescribed antihypertensive drugs were recorded. The use of monotherapy versus combination therapy and preference for generic versus brand-name drugs were also evaluated. Descriptive statistics were used for analysis. **Result:** Of the 100 patients, 58% were male and 42% female. The majority were aged over 60 years (50%). Calcium Channel Blockers (34%) were the most commonly prescribed antihypertensives, followed by Angiotensin Receptor Blockers (28%) and Beta-blockers (15%). Monotherapy was prescribed to 60% of patients, while 40% received combination therapy. The most common combination was CCB + ARB (30%). Diabetes mellitus (28%) was the most frequent co-morbidity. Generic drugs were prescribed in 68% of cases, reflecting a cost-conscious prescribing pattern. **Conclusion:** The study highlights a preference for monotherapy using CCBs and ARBs in hypertensive patients. Combination therapy was common among patients with co-morbidities. There is a positive inclination towards generic prescribing. Continuous prescription audits are essential to promote rational use of antihypertensive drugs and improve patient outcomes.

INTRODUCTION

Hypertension is one of the most prevalent non-communicable diseases globally and serves as a major contributor to cardiovascular morbidity and mortality.[1,2] Often asymptomatic, hypertension is aptly termed the "silent killer" as it requires lifelong management to prevent serious complications such as stroke, myocardial infarction, heart failure, and chronic kidney disease.[3] According to the World Health Organization, approximately 1.28 billion adults aged 30–79 years are affected by hypertension worldwide, with two-thirds residing in low- and middle-income countries like India.[4]

Effective management of hypertension not only necessitates accurate diagnosis but also the rational selection and use of antihypertensive medications tailored to individual patient profiles, including age, co-existing medical conditions, and risk factors.[1,5] The wide range of antihypertensive drug classes—such as calcium channel blockers (CCBs), angiotensin receptor blockers (ARBs), angiotensin-converting enzyme inhibitors (ACEIs), beta-blockers, and diuretics—requires careful selection to ensure efficacy, safety, tolerability, and affordability.[2,5]

In recent years, increasing emphasis has been placed on the use of generic medications as a cost-effective alternative to brand-name drugs, especially in

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resource-limited settings.[6] Additionally, while monotherapy is commonly the initial approach in managing hypertension, many patients require combination therapy to achieve optimal blood pressure control, particularly those with severe hypertension or associated co-morbidities such as diabetes mellitus and ischemic heart disease.[3,5] Understanding prescribing trends is crucial to promote rational drug use and improve patient outcomes.

The present study was undertaken to evaluate the current prescription patterns of antihypertensive medications in a tertiary care teaching hospital. By analyzing the trends in drug selection, combination use, and prescribing habits, the study aims to identify opportunities for improving the rational use of antihypertensive agents and optimizing patient care.

MATERIALS AND METHODS

Study Design and Setting: A **prospective observational study** was conducted at the **Department of General Medicine, Sreenarayana Institute of Medical Sciences, Chalakka, Ernakulam, Kerala**. The study was carried out over a period of **six months**, from **January 2013 to June 2013**.

Study Population

The study included **100 patients** diagnosed with hypertension attending the outpatient department of the hospital during the study period.

Inclusion Criteria

Patients aged **18 years and above**.

Patients with a **confirmed diagnosis of hypertension** receiving at least one antihypertensive medication.

Patients willing to provide informed consent.

Exclusion Criteria

Pregnant women with hypertension.

Patients with incomplete medical records.

Patients not willing to participate.

Data Collection

Data were collected using a **structured data collection form** which included the following variables:

Demographic details: Age and gender.

Clinical profile: Presence of co-morbidities such as diabetes mellitus, dyslipidemia, ischemic heart disease, and chronic kidney disease.

Prescribing details: Class of antihypertensive drugs prescribed, use of monotherapy or combination therapy, and whether the medication was prescribed by **generic or brand name**.

Data Analysis

All collected data were entered into Microsoft Excel and analyzed using **descriptive statistics**. The results were expressed in terms of **frequencies** and **percentages**. Tables were used to present the distribution of antihypertensive prescriptions, demographic characteristics, co-morbidities, and therapy patterns.

RESULTS

A total of 100 hypertensive patients were included in the study. The demographic profile of the study participants is presented in Table 1. The majority of the patients were aged above 60 years (50%), followed by those between 41–60 years (38%) and 18–40 years (12%). Males constituted a slightly higher proportion of the study population (58%) compared to females (42%).

The prescription patterns of antihypertensive drugs are summarized in Table 2. Calcium Channel Blockers (CCBs) were the most commonly prescribed class of antihypertensive agents, accounting for 34% of prescriptions, followed by Angiotensin Receptor Blockers (ARBs) (28%), Beta-blockers (15%), Angiotensin-Converting Enzyme Inhibitors (ACEIs) (10%), and Diuretics (8%). A small proportion (5%) of patients received other agents such as alpha-blockers or centrally acting antihypertensives.

In terms of therapeutic strategy, monotherapy was prescribed to 60% of the patients, while the remaining 40% were managed with combination therapy (Table 3). Among those on combination therapy, the most frequently prescribed combinations included CCB + ARB (30%), ARB + Diuretic (25%), and CCB + Beta-blocker (20%). Other less common combinations accounted for 25% of the combination prescriptions (Table 4).

The prevalence of co-morbid conditions associated with hypertension is detailed in Table 5. The most frequent co-morbidity was Diabetes Mellitus (28%), followed by Dyslipidemia (15%), Ischemic Heart Disease (10%), and Chronic Kidney Disease (6%). Notably, 41% of patients did not present with any co-morbidities.

Regarding prescription practices, generic medications were prescribed in 68% of cases, while brand-name drugs were used in 32% of prescriptions (Table 6), indicating a favorable trend toward cost-effective prescribing.

Table 1: Demographic Characteristics of Study Participants (n = 100)

Variable	Frequency (n)	Percentage (%)
Age Group (years)		
18–40 years	12	12%
41–60 years	38	38%
>60 years	50	50%
Gender		
Male	58	58%
Female	42	42%

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Table 2: Distribution of Antihypertensive Drugs Prescribed (n = 100)

Class of Antihypertensive	Number of Prescriptions (n)	Percentage (%)
Calcium Channel Blockers (CCBs)	34	34%
Angiotensin Receptor Blockers (ARBs)	28	28%
Beta-blockers	15	15%
Angiotensin-Converting Enzyme Inhibitors (ACEIs)	10	10%
Diuretics	8	8%
Others (e.g., Alpha-blockers, centrally acting agents)	5	5%

Table 3: Monotherapy vs. Combination Therapy (n = 100)

Type of Therapy	Number of Patients (n)	Percentage (%)
Monotherapy	60	60%
Combination Therapy	40	40%

Table 4: Commonly Used Combination Therapies Among Hypertensive Patients (n = 40)

Combination Therapy	Number of Patients (n)	Percentage (%)
CCB + ARB	12	30%
ARB + Diuretic	10	25%
CCB + Beta-blocker	8	20%
Other Combinations	10	25%

Table 5: Co-morbidities Associated with Hypertension (n = 100)

Co-morbidity	Number of Patients (n)	Percentage (%)
Diabetes Mellitus	28	28%
Dyslipidemia	15	15%
Ischemic Heart Disease	10	10%
Chronic Kidney Disease	6	6%
No Co-morbidities	41	41%

Table 6: Prescription by Generic vs. Brand Name (n = 100)

Prescription Type	Number (n)	Percentage (%)
Generic name	68	68%
Brand name	32	32%

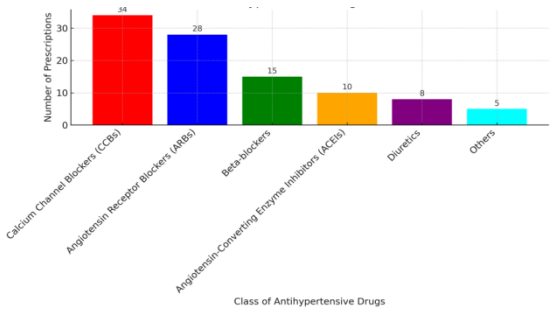

Figure 1: Distribution of Antihypertensive Drugs Prescribed

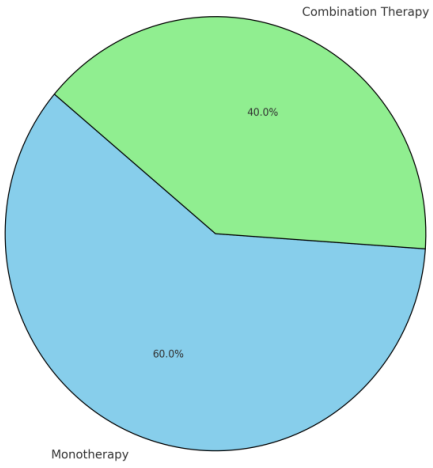

Figure 2: Monotherapy vs. Combination Therapy

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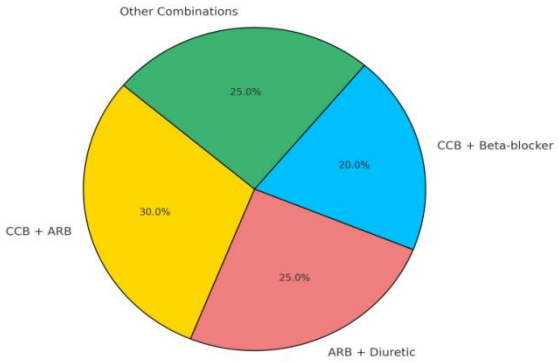

Figure 3: Commonly Used Combination Therapies Among Hypertensive Patients

DISCUSSION

The present study was conducted to analyze the prescription patterns of antihypertensive drugs in a tertiary care teaching hospital over a six-month period. The findings provide valuable insights into current trends in hypertension management in clinical practice, which are essential for promoting rational drug use.

In this study, the majority of hypertensive patients were above 60 years of age (50%), emphasizing the well-established association between advancing age and increased hypertension prevalence. This observation is consistent with previous studies which also highlight age as a significant risk factor for hypertension development.[7,8] A slight male predominance (58%) was noted in the study population, which aligns with other research reporting higher hypertension prevalence among males, particularly in middle-aged and older groups.[9]

The most commonly prescribed class of antihypertensive drugs in the present study was Calcium Channel Blockers (34%), followed by Angiotensin Receptor Blockers (28%) and Beta-blockers (15%). This pattern mirrors findings from similar studies in India and other countries where CCBs and ARBs are frequently chosen due to their efficacy, favorable safety profile, and tolerability, particularly in elderly patients and those with metabolic syndrome.[8,10] The shift towards these classes reflects adherence to updated hypertension guidelines and growing awareness of cardiovascular protection associated with these agents.

Monotherapy was prescribed in 60% of cases, while 40% of patients required combination therapy, which is in agreement with recommendations that suggest initiating monotherapy and escalating to combinations when needed for better blood pressure control.[9,11] The most common combination therapy used was CCB + ARB, which is rational due to their synergistic effects and complementary mechanisms of action.

The presence of co-morbidities such as Diabetes Mellitus (28%) and Dyslipidemia (15%) among hypertensive patients underscores the need for individualized drug selection to manage both hypertension and associated conditions effectively. These findings are consistent with previous studies that highlighted the importance of tailored treatment in multi-morbid patients to prevent adverse outcomes.[7,12]

An encouraging observation was that 68% of prescriptions were written for generic medications, reflecting increasing physician awareness of the cost-effectiveness and accessibility of generics, which is crucial in resource-limited healthcare settings.[10,11] Promoting generic prescribing aligns with international efforts to make essential medications affordable while maintaining therapeutic efficacy.

Overall, the study reveals a rational prescribing pattern for antihypertensive management, with careful consideration of patient profiles, adherence to guidelines, and cost considerations. Nonetheless, continuous prescription audits, ongoing medical education, and reinforcement of evidence-based practices are necessary to further optimize treatment and improve patient outcomes.[11,12]

CONCLUSION

This prospective observational study highlights the prevailing prescription patterns of antihypertensive drugs in a tertiary care teaching hospital. The majority of patients were managed with monotherapy, predominantly using calcium channel blockers and angiotensin receptor blockers, reflecting adherence to current hypertension guidelines. Combination therapy was appropriately utilized in patients with uncontrolled hypertension or associated co-morbidities, such as diabetes mellitus and dyslipidemia. The substantial use of generic medications indicates a positive trend towards cost-effective prescribing. Regular prescription audits, continuous medical education, and adherence to evidence-based guidelines are essential to ensure rational drug use, optimize blood pressure control, and minimize cardiovascular risks in hypertensive patients.

REFERENCES

1. Alkaabi MS, Rabbani SA, Rao PGM, Ali SR. Prescription Pattern of Antihypertensive Drugs: An Experience from a Secondary Care Hospital in the United Arab Emirates. J Res Pharm Pract. 2019 Apr-Jun;8(2):92-100. doi: 10.4103/jrpp.JRPP_18_85. PMID: 31367644; PMCID: PMC6636421.
2. Venkataraman R, Rashid M, Shashikantha B, Soumya A, Vijayan G, Manuel GG, Islam S. Prescribing pattern of antihypertensive medication and adherence to Joint National Commission-8 guidelines in a rural tertiary care Indian teaching hospital. J Basic Clin Physiol Pharmacol. 2019 Sep 10;31(1). doi: 10.1515/jbcpp-2019-0133. PMID: 31503542.
3. Abdelkader NN, Awaisu A, Elewa H, El Hajj MS. Prescribing patterns of antihypertensive medications: A systematic review of literature between 2010 and 2020. Explor Res Clin Soc Pharm. 2023 Aug 5;11:100315. doi: 10.1016/j.rcsop.2023.100315. PMID: 37635839; PMCID: PMC10448163.

ISSN (O): 2687-5365; ISSN (P): 2753-6556

4. Tandon VR, Sharma S, Mahajan S, Mahajan A, Khajuria V, Mahajan V, Prakash C. Antihypertensive drug prescription patterns, rationality, and adherence to Joint National Committee-7 hypertension treatment guidelines among Indian postmenopausal women. J Midlife Health. 2014 Apr;5(2):78-83. doi: 10.4103/0976-7800.133994. PMID: 24970986; PMCID: PMC4071649.
5. Jarari N, Rao N, Peela JR, Ellafi KA, Shakila S, Said AR, Nelapalli NK, Min Y, Tun KD, Jamallulail SI, Rawal AK, Ramanujam R, Yedla RN, Kandregula DK, Argi A, Peela LT. A review on prescribing patterns of antihypertensive drugs. Clin Hypertens. 2016 Mar 27;22:7. doi: 10.1186/s40885-016-0042-0. PMID: 27019747; PMCID: PMC4808570.
6. Shukla G, Tejus A, Vishnuprasad R, Pradhan S, Prakash MS. A prospective study to assess the medication adherence pattern among hypertensives and to evaluate the use of cellular phone text messaging as a tool to improve adherence to medications in a tertiary health-care center. Indian J Pharmacol. 2020 Jul-Aug;52(4):290-295. doi: 10.4103/ijp.IJP_498_19. PMID: 33078730; PMCID: PMC7722917.
7. Jha H, Khan TA, Khan N, Fatima G. Analysis of Prescription Pattern of Anti-diabetic Medications in a Teaching Hospital in North India. Cureus. 2024 Jun 28;16(6):e63343. doi: 10.7759/cureus.63343. PMID: 39070354; PMCID: PMC11283627.
8. Mankadavath A, Chandrasekhar D, Thomas T, Zuhra F, Kaipanthodi S, Parambil JC. A prospective drug use evaluation of antihypertensive drugs in in-patients of a tertiary referral care hospital. J Basic Clin Physiol Pharmacol. 2015 May;26(3):295-300. doi: 10.1515/jbcpp-2013-0131. PMID: 25153590.
9. Datta S. Utilization Study of Antihypertensives in a South Indian Tertiary Care Teaching Hospital and Adherence to Standard Treatment Guidelines. J Basic Clin Pharm. 2016 Dec;8(1):33-37. doi: 10.4103/0976-0105.195100. PMID: 28104972; PMCID: PMC5201061.
10. Shukrala F, Gabriel T. Assessment of prescribing, dispensing, and patient use pattern of antihypertensive drugs for patients attending outpatient department of Hiwot Fana Specialized University Hospital, Harar, Eastern Ethiopia. Drug Des Devel Ther. 2015 Jan 17;9:519-23. doi: 10.2147/DDDT.S73670. PMID: 25632220; PMCID: PMC4304532.
11. Jain S, Upadhyaya P, Goyal J, Kumar A, Jain P, Seth V, Moghe VV. A systematic review of prescription pattern monitoring studies and their effectiveness in promoting rational use of medicines. Perspect Clin Res. 2015 Apr-Jun;6(2):86-90. doi: 10.4103/2229-3485.154005. PMID: 25878953; PMCID: PMC4394586.
12. Simegn BK, Chelkeba L, Alamirew BD. Clinicians' prescribing pattern, rate of patients' medication adherence and its determinants among adult hypertensive patients at Jimma University Medical Center: Prospective cohort study. PLoS One. 2021 Nov 15;16(11):e0259421. doi: 10.1371/journal.pone.0259421. PMID: 34780479; PMCID: PMC8592482.

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