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Prescription Pattern Analysis of Anti-Hypertensive Drugs in A Primary Care Hospital Rajasthan Region

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Abstract
Hypertension is a growing global health issue contributing significantly to cardiovascular morbidity and mortality. This retrospective observational study was conducted at Anand Hospital, a primary care facility in Rajasthan, to evaluate the prescription patterns of antihypertensive drugs. The study included adults diagnosed with hypertension, with or without comorbidities, over a six-month period. The analysis assessed demographics, types of therapies, classes of drugs, and adherence to treatment guidelines. Findings revealed ARBs and calcium channel blockers as the most prescribed drug classes. Combination therapies were preferred in patients with comorbidities such as diabetes and CKD. The study highlights the need for rational prescribing and greater alignment with standard guidelines in primary care settings.

Keywords: Hypertension, Antihypertensive Drugs, Prescription Pattern, Combination Therapy, ARBs, Comorbidities, Rational Prescribing, Guideline Adherence.

1. INTRODUCTION

Hypertension, or high blood pressure, is a chronic condition affecting over 1.13 billion people worldwide. It is a leading cause of cardiovascular disease, stroke, renal failure, and premature death. Hypertension is often asymptomatic, earning the label “silent killer.” Classification systems such as ACC/AHA and JNC-8 provide diagnostic criteria, where SBP ≥130 mmHg or DBP ≥80 mmHg is considered hypertensive.
In India, the prevalence of hypertension is rising due to urbanization, sedentary lifestyles, and dietary changes. The WHO and Indian guidelines emphasize early diagnosis and appropriate management using both lifestyle changes and pharmacotherapy.
Antihypertensive drugs include several classes such as ARBs, ACEIs, CCBs, β-blockers, and diuretics. Prescription pattern analysis helps identify prescribing trends, evaluate rational drug use, assess adherence to treatment guidelines, and improve patient outcomes, especially in primary care where the first line of treatment is initiated.

2. Objectives of the Study

1. To analyse the prescription patterns of antihypertensive drugs.

2. To identify trends in monotherapy versus combination therapy.
3. To evaluate drug use based on patient demographics (age, sex, comorbidities).
4. To assess adherence to international and national hypertension treatment guidelines.
5. To study the impact of comorbidities (diabetes, CKD, dyslipidaemia) on antihypertensive drug choice.

3. Literature Review

Numerous studies have documented antihypertensive prescribing trends across India and globally:

- Garg et al. (2016) observed low adverse effects with atenolol but emphasized dose-related β1 selectivity loss.
- Raja Ram et al. (2015) noted diuretics and ARBs as most frequently prescribed with 60.76% on combination therapy.
- Khurshid et al. (2015) reported higher ADRs with calcium channel blockers.
- Kumar et al. (2011) found β-blockers as most associated with ADRs in a hospital setup.
- Rani et al. (2015) found ACEIs and ACEI+CCB combos as most common.

These findings indicate variability in prescribing based on institutional preferences, drug availability, and patient comorbidities.

4. Materials and Methods

Study Design

- Retrospective observational study

Study Site

- Anand Hospital, Newai (Primary Care Hospital), Rajasthan

Study Duration

- January 2025 – July 2025

Study Population

- Adults ≥18 years diagnosed with hypertension (JNC-8 criteria)
- Included: With or without comorbidities (diabetes, CKD, dyslipidaemia)
- Excluded: Pregnant women, secondary hypertension, incomplete records

Data Collection Tools

- Standard data extraction sheet from OPD, IPD, and pharmacy records

Analysis

- Data entered in Excel and analysed using SPSS
- Descriptive statistics (percentages, frequencies)

5. Results

5.1 Demographic Data

- **Sex Distribution:** 55% male, 45% female
- **Age Distribution:**
- 30–40 yrs: 15%
- 41–50 yrs: 35%
- 51–60 yrs: 30%
- 60 yrs: 20%
- **BMI:** 40% overweight/obese

Drug Class	Common Drugs	Frequency (%)	Dosage Range	Key Benefits
ACEIs	Enalapril, Ramipril	15%	2.5–10 mg once/twice daily	Reno protective, beneficial in diabetes and CKD.
ARB drugs (Angiotensin II Receptor Blockers)	Telmisartan, Losartan	30%	40–80 mg once daily	Fewer side effects, suitable for diabetes, CKD, As well as dyslipidaemia.
Calcium antagonists	Amlodipine, Nifedipine	25%	5–10 mg once daily	Efficient for isolated systolic High blood pressure As well as elderly patients.
B-Adrenergic blockers	Bisoprolol, Propranolol	12%	2.5–10 mg once/twice daily	Indicated for heart failure, post-MI, As well as anxiety.
Diuretic agents	Hydrochlorothiazide, Chlorthalidone, Spironolactone	10%	12.5–25 mg once daily	Volume Management, Efficient in heart failure, CKD, As well as resistant High blood pressure.
Combination Drugs	Telmisartan + Amlodipine, Losartan + Hydrochlorothiazide	8%	Fixed doses (e.g., 40 mg + 5 mg)	Simplifies therapy, improves compliance.

5.2 Diagnosis and Comorbidities

Key Observations As well as Trends in Antihypertensive Prescribing Patterns

5.3 Monotherapy Distribution

- ACEIs/ARBs (e.g., Telmisartan, Losartan): 30%
- CCBs (e.g., Amlodipine): 20%

6. Discussion

The findings reveal a preference for ARBs and CCBs in both monotherapy and combination therapy, aligning with national and international guidelines. Combination therapy, especially dual or triple regimens, was prominent in cases with diabetes and CKD. Fixed-dose combinations (FDCs) improved adherence. However, diuretics were underutilized despite being cost-effective.

Gender and age impacted drug choice—older patients were often given well-tolerated agents. There was minimal prescribing of renin inhibitors or central agents, reflecting either limited availability or low physician preference.

Comparison with past studies (Raja Ram et al., Rani et al.) confirms these trends. Regional studies reinforce the importance of rational and guideline-based therapy to prevent cardiovascular complications.

7. Conclusion

- ARBs and CCBs are the most commonly prescribed antihypertensive classes.
- Combination therapy dominates, particularly in patients with comorbidities.
- The overall prescribing pattern reflects partial adherence to hypertension guidelines.
- There is a need to improve cost-effective prescribing and optimize drug selection based on patient-specific factors.

8. Recommendations

- Promote rational use of fixed-dose combinations.
- Encourage prescribing from the WHO essential drug list.
- Include pharmacists in patient counselling.
- Increase CME programs for prescribers on hypertension guidelines.
- Consider cost and patient adherence when selecting therapy.

9. Limitations

- Study confined to one hospital in Rajasthan.
- Retrospective design may not reflect recent updates in therapy.
- No follow-up data to correlate prescriptions with BP control.
- Cost-effectiveness analysis not included.

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