

Original Research Article

COMPARATIVE PRESCRIBING PATTERNS OF ANTIHYPERTENSIVE DRUGS IN DIABETIC VS. NON-DIABETIC PATIENTS IN TELANGANA

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Received : 16/08/2025
Received in revised form : 03/10/2025
Accepted : 21/10/2025

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DOI: 10.70034/ijmedph.2025.4.115

Source of Support: Nil,

Conflict of Interest: None declared

Int J Med Pub Health
2025; 15 (4); 640-643

ABSTRACT

Background: Hypertension is a major contributor to cardiovascular morbidity and mortality, particularly among patients with diabetes mellitus. Optimal antihypertensive therapy selection is essential to achieve blood pressure control while minimizing adverse effects. Patterns of drug prescribing may differ between diabetic and non-diabetic hypertensive patients. The study aimed to evaluate and compare the prescribing patterns of antihypertensive drugs, therapy types, combination strategies, and the occurrence of adverse drug reactions in diabetic and non-diabetic hypertensive patients.

Materials and Methods: This cross-sectional observational study conducted in Telangana included 300 patients, 150 with diabetes and hypertension and 150 non-diabetic hypertensive patients, recruited between January 2025 and June 2025. Demographic data, duration of hypertension, and antihypertensive therapy details were collected. Drug classes, monotherapy, dual, and triple therapy usage were analyzed. Adverse drug reactions were recorded through patient interviews. Data were analyzed using SPSS v26, with continuous variables compared using independent t-tests and categorical variables using chi-square tests; $p < 0.05$ was considered significant.

Results: The mean age of diabetic patients was higher than non-diabetics (58.2 ± 9.4 vs. 54.6 ± 10.1 years; $p = 0.002$). ACE inhibitors were most prescribed in diabetics (42.7%), whereas calcium channel blockers predominated in non-diabetics (46.7%). Dual therapy was more common in diabetics (45.3%), with ARB + diuretic being the leading combination. Triple therapy was less frequent. Adverse drug reactions were rare and comparable between groups, with cough and dizziness being most common.

Conclusion: Prescribing patterns differ between diabetic and non-diabetic hypertensive patients, with ARB-based dual therapy predominant in diabetics and CCB monotherapy in non-diabetics. Overall, therapies were well tolerated, highlighting the need for individualized treatment strategies.

Keywords: Hypertension, Diabetes Mellitus, Antihypertensive Therapy, Prescribing Patterns.

INTRODUCTION

Hypertension is a major global public health concern and a leading risk factor for cardiovascular morbidity and mortality.^[1] It is often asymptomatic but contributes significantly to the development of heart

disease, stroke, and renal failure.^[2,3] The prevalence of hypertension continues to rise worldwide, particularly in low- and middle-income countries, due to urbanization, lifestyle changes, and increased life expectancy.^[4,5] Effective management of

hypertension is essential to prevent its complications and reduce healthcare burden.^[6]

Patients with diabetes mellitus frequently present with coexisting hypertension, which substantially increases their risk for cardiovascular and renal complications.^[7] The coexistence of these conditions necessitates careful selection of antihypertensive therapy to achieve optimal blood pressure control while minimizing adverse effects.^[8] Diabetic patients often require combination therapy and specific drug classes, such as ACE inhibitors or ARBs, to provide both antihypertensive and renal-protective effects.^[9] In contrast, non-diabetic hypertensive patients may have different prescribing patterns depending on their comorbidities and drug tolerance.^[10]

Despite the availability of numerous antihypertensive agents, there is considerable variation in prescribing practices across different patient populations. Factors influencing drug selection include patient characteristics, comorbid conditions, drug efficacy, safety profile, and physician preference.^[11] Comparative data on the prescribing patterns of antihypertensive drugs in diabetic versus non-diabetic hypertensive patients are limited, and such information is vital for optimizing treatment strategies and improving patient outcomes.

Given this context, the present study was aimed to evaluate and compare the prescribing patterns of antihypertensive drugs among diabetic and non-diabetic hypertensive patients.

MATERIALS AND METHODS

This observational cross-sectional study was conducted in Telangana over a period of 6 months, from January 2025 to June 2025. The study population included adult patients (> 18 years) diagnosed with hypertension who were attending the outpatient department. A total of 300 participants were enrolled, comprising 150 diabetic patients with coexisting hypertension and 150 non-diabetic hypertensive patients. Patients with secondary hypertension, pregnancy, chronic kidney disease, or other major systemic illnesses were excluded to minimize confounding factors.

Detailed demographic data, including age, gender, and duration of hypertension, were recorded for all participants. Clinical evaluation involved

measurement of blood pressure using a calibrated sphygmomanometer, with the mean of two readings taken five minutes apart. The use of antihypertensive medications, including monotherapy and combination therapy, was documented. Drug classes recorded included ACE inhibitors, angiotensin receptor blockers (ARBs), calcium channel blockers (CCBs), beta blockers, diuretics, and alpha blockers. The choice of therapy, dosage, and duration of treatment were noted from patient records and prescriptions.

Participants were interviewed to assess any adverse drug reactions (ADRs) associated with their antihypertensive therapy. Information regarding drug combinations, frequency of use, and side effects was systematically collected. Patients were categorized based on their therapy as receiving monotherapy, dual therapy, or triple therapy. Common drug combinations such as ACEI + diuretic, ARB + CCB, and others were specifically analyzed to identify prescribing patterns in diabetic versus non-diabetic groups.

Data were entered into Microsoft Excel and analyzed using SPSS version 26. Continuous variables such as age, blood pressure, and duration of hypertension were expressed as mean $\pm$ standard deviation (SD) and compared using the independent t-test. Categorical variables, including gender distribution, drug class usage, therapy type, and adverse drug reactions, were presented as frequency and percentage and compared using the chi-square test. A p-value of less than 0.05 was considered statistically significant for all analyses.

RESULTS

The study included 300 participants, equally divided into diabetic and non-diabetic groups. The mean age of diabetic patients was higher compared to non-diabetic patients (58.2 ± 9.4 vs. 54.6 ± 10.1 years; $p = 0.002$). Males accounted for slightly more than half of the total study population (52.7%), with no significant gender difference between groups ($p = 0.49$). The duration of hypertension was significantly longer in diabetic patients than in non-diabetic patients (7.2 ± 3.8 vs. 6.1 ± 3.2 years; $p = 0.01$), indicating a longer disease burden among diabetics. [Table 1]

Table 1: Baseline Characteristics of Study Participants

Variable		Diabetic (n = 150)	Non-Diabetic (n = 150)	Total (N = 300)	p-value
Age (years)	Mean $\pm$ SD	58.2 ± 9.4	54.6 ± 10.1	56.4 ± 9.8	0.002
Gender	Male	82 (54.7%)	76 (50.7%)	158 (52.7%)	0.49
	Female	68 (45.3%)	74 (49.3%)	142 (47.3%)	
Duration of Hypertension (yrs)	Mean $\pm$ SD	7.2 ± 3.8	6.1 ± 3.2	6.6 ± 3.5	0.01

ACE inhibitors were the most frequently prescribed antihypertensive drugs among diabetic patients (42.7%), whereas calcium channel blockers were more commonly used in non-diabetic patients

(46.7%). ARBs were prescribed in 30.7% of diabetic patients and 25.3% of non-diabetic patients. Beta blockers and diuretics were used in 21.3% and 26.7% of diabetic patients, respectively, with slightly higher

beta blocker use observed in non-diabetics (32.0%).
[Table 2]

Table 2: Distribution of Antihypertensive Drug Classes Used

Drug Class	Diabetic (n = 150)	Non-Diabetic (n = 150)	Total (N = 300)
ACE Inhibitors	64 (42.7%)	32 (21.3%)	96 (32.0%)
ARBs	46 (30.7%)	38 (25.3%)	84 (28.0%)
Calcium Channel Blockers (CCB)	58 (38.7%)	70 (46.7%)	128 (42.7%)
Beta Blockers	32 (21.3%)	48 (32.0%)	80 (26.7%)
Diuretics	40 (26.7%)	36 (24.0%)	76 (25.3%)

Monotherapy was more common in non-diabetic patients (50.7%) compared to diabetic patients (38.7%), while dual therapy was more frequently prescribed for diabetic patients (45.3% vs. 37.3%). Triple therapy was used in a smaller proportion of

both groups, accounting for 16.0% in diabetics and 12.0% in non-diabetics. These findings reflect a tendency for more intensive therapy among diabetic patients to achieve blood pressure control. [Table 3]

Table 3: Type of Antihypertensive Therapy

Type of Therapy	Diabetic (n = 150)	Non-Diabetic (n = 150)	Total (N = 300)
Monotherapy	58 (38.7%)	76 (50.7%)	134 (44.7%)
Dual Therapy	68 (45.3%)	56 (37.3%)	124 (41.3%)
Triple Therapy	24 (16.0%)	18 (12.0%)	42 (14.0%)

The most common antihypertensive drug combinations included ACEI + diuretic in 18.7% of diabetic patients and ARB + CCB in 22.7%. Other combinations such as CCB + beta blocker, ARB +

diuretic, and ACEI + CCB were used in similar proportions across both groups, indicating a variety of combination strategies tailored to individual patient needs. [Table 4]

Table 4: Common Drug Combinations Used

Drug Combination	Diabetic (n = 150)	Non-Diabetic (n = 150)	Total (N = 300)
ACEI + Diuretic	28 (18.7%)	20 (13.3%)	48 (16.0%)
ARB + CCB	34 (22.7%)	26 (17.3%)	60 (20.0%)
CCB + Beta Blocker	22 (14.7%)	28 (18.7%)	50 (16.7%)
ARB + Diuretic	16 (10.7%)	14 (9.3%)	30 (10.0%)
ACEI + CCB	18 (12.0%)	12 (8.0%)	30 (10.0%)

Adverse drug reactions were reported in a minority of patients, with cough observed in 8.0% of diabetic and 4.0% of non-diabetic patients. Dizziness, fatigue, and leg edema were reported in 4–8% of participants

across both groups, with no statistically significant differences noted ($p > 0.05$). Overall, the safety profile of antihypertensive therapy was comparable between diabetic and non-diabetic patients. [Table 5]

Table 5: Reported Adverse Drug Reactions (ADRs)

Type of ADR	Diabetic n (%)	Non-Diabetic n (%)	Total n (%)	p-value
Cough	12 (8.0%)	6 (4.0%)	18 (6.0%)	0.14
Dizziness	10 (6.7%)	12 (8.0%)	22 (7.3%)	0.67
Fatigue	8 (5.3%)	10 (6.7%)	18 (6.0%)	0.64
Leg Edema	6 (4.0%)	8 (5.3%)	14 (4.7%)	0.58

DISCUSSION

The present study aimed to evaluate and compare the prescribing patterns of antihypertensive medications in diabetic and non-diabetic hypertensive patients. The findings revealed differences in drug selection, therapy types, and the incidence of adverse drug reactions (ADRs) between the two groups.

In our cohort, ARBs were the most frequently prescribed class of antihypertensive agents among diabetic patients (42.7%), followed by CCBs (38.7%). In contrast, non-diabetic patients predominantly received CCBs (46.7%), with ARBs prescribed to 25.3%. This preference aligns with

existing literature, which suggests that ARBs and ACE inhibitors (ACEIs) are favored in diabetic hypertensive patients due to their renal protective effects. A study by Dhanaraj et al. reported that 59% of diabetic patients were prescribed ACEIs, and 52% received ARBs.^[13] Similarly, Sharma et al. (2018) reported ACEIs, particularly enalapril, as the most prescribed agents, accounting for over 80% of prescriptions.^[14]

Regarding therapy types, dual therapy was more common in diabetic patients (45.3%) compared to non-diabetic patients (37.3%). This trend reflects the need for more aggressive blood pressure control in diabetic individuals to mitigate cardiovascular and

renal risks. Johnson et al. found that 83.5% of hypertensive patients with diabetes were prescribed ACEIs or ARBs, often in combination with other agents like diuretics.^[15] This pattern is comparable to the findings of Shastry R et al., where among 336 diabetic-hypertensive patients, dual therapy with diuretics plus ACEI or ARB accounted for 35.6% of patients, with well-controlled blood pressure observed in 51% of those on diuretic combination therapy.^[16]

The incidence of ADRs was relatively low in our study, with no significant differences between diabetic and non-diabetic groups. Common ADRs included cough, dizziness, fatigue, and leg edema. These findings are consistent with previous research indicating that while ADRs are a concern, their occurrence is generally low and comparable across different patient populations.

The study has some limitations, including its cross-sectional design, which prevents establishing causal relationships, limiting generalizability. Additionally, reliance on patient records and self-reported data may introduce information bias, and long-term outcomes or therapy effectiveness were not assessed.

CONCLUSION

This study highlights distinct prescribing patterns of antihypertensive drugs in diabetic and non-diabetic hypertensive patients, with ARBs being the most commonly used agents in diabetics and CCBs in non-diabetics. Dual therapy, particularly ARB-based combinations, was the predominant approach for blood pressure control, reflecting guideline-based management and the multifactorial nature of hypertension in diabetics. The low incidence of adverse drug reactions suggests that current prescribing practices are generally safe and well-tolerated, emphasizing the importance of individualized therapy to optimize outcomes in both patient groups.

Conflict of Interest: None declared

Funding: None

Acknowledgement: None

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