

# Prescription Pattern of Antihypertensives in Cardiology Unit at Tertiary Care Hospital

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## ABSTRACT

**Aim:** The main aim of present study is to know the prescription pattern of antihypertensive drugs in the cardiac unit of hospitalized patients in tertiary care hospital.

**Materials and Methods:** A retrospective study was carried out in hospital from January to December 2013. A total of 284 case files were taken for the study. The analysis was done for antihypertensives in each prescription, prescribing frequency of individual drug, sex and age frequency, single and combination therapy.

**Results:** The prescribing frequency of diuretics was (79.2%) followed by Angiotensin converting enzyme inhibitors (30.2%),  $\beta$ -blockers (26.4%), calcium channel blockers (21.1%), Angiotensin receptor blockers (15.1%),  $\alpha+\beta$  blockers (8.4%), Vasodilators (7.3%). Two drug combination was predominantly given in 115 prescriptions out of 284 total prescriptions.

**Conclusion:** The study concludes that most of the hypertensive patients received two drug combination among which diuretics and Angiotensin converting enzyme inhibitors were more commonly prescribed.

**Keywords:** Antihypertensive drugs, prescription pattern, cardiac unit

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## INTRODUCTION

Hypertension is defined as a systolic reading  $> 140$ mm of Hg and diastolic reading  $> 90$  mm of Hg.<sup>[1]</sup> Hypertension is a leading contributor to the global burden of cardiovascular morbidity and mortality. Prevalence of hypertension in India in 2000 was 60.4 million males and 57.8 million females and projected to increase to 107. <sup>[3]</sup> million and 106.2 million respectively in 2025. Hypertension varies from 4-15% in urban and 2-8% in rural population.<sup>[2]</sup>

Prevalence of hypertension and cardiovascular risk factors among inpatients appear to be high, at over 50%.<sup>[3]</sup> Socioeconomic, behavioural, stressful life style of nutritional issues of people lead to enormous increase of cardiovascular diseases.<sup>[4]</sup> To reduce the complications of hypertension various drug classes are used like diuretics, calcium channel blockers, ACE inhibitors, angiotensin receptor blockers,  $\beta$  blockers, vasodilators and sympatholytic drugs.<sup>[5]</sup>

Management of hypertension is an important step to decrease the mortality and morbidity of cardiovascular disease and to prevent uncontrolled complications.<sup>[6]</sup> The study was aimed at identifying the prescription pattern of antihypertensive agents in cardiology unit. The ultimate aim of antihypertensive drug therapy is to minimize or control the morbidity and mortality associated with hypertension.<sup>[7]</sup>

Data about drug usage pattern in the treatment of hypertension can provide useful information for improving clinical practise in this field.<sup>[8]</sup> Research showed that adoption of recommended antihypertensive prescribing guidelines is not uniform but instead varies by patients and physician characteristics.<sup>[9]</sup> Choice of drugs for particular patient changes at short intervals because of factors like efficacy, side effects, cost and development of newer drugs.<sup>[10]</sup> Drug utilization studies seek to monitor, evaluate and suggest modifications in the prescribing practices with the aim of making the medical care rationale and cost effective.<sup>[11]</sup>

Hypertension has been identified as a major risk factor not only for the development of diabetes but also for the development of micro and macro vascular complications, i.e, nephropathy, neuropathy, retinopathy, coronary artery disease, stroke, peripheral vascular disease in diabetic patients.<sup>[12]</sup> Despite the availability of wide range of antihypertensive drugs hypertension and its complications were still important causes of adult morbidity and mortality. More than 50% of treated hypertensive patients have blood pressure level greater than 140/90 mm of Hg.<sup>[13]</sup> Rationale prescribing and the safe use of drugs are important in the management of hypertensive patients since they were on chronic medication.<sup>[14]</sup>

## MATERIALS AND METHODS

This retrospective study was conducted at tertiary care hospital, Karimnagar, Telangana from January to December 2013. The protocol of the study was approved by Institutional Human Ethical Committee (IHEC/JAN/2013 dated 5/12/2012) at Chalmeda Anand Rao Institute of Medical Sciences, Karimnagar. A total of 284 patient prescriptions were taken for the study.

### Inclusion Criteria

Patients prescriptions with age group > 18years  
Hypertension with or without cardiovascular disease  
Hypertension with or without diabetes mellitus  
Patients prescriptions receiving antihypertensive drugs with combinations  
Smokers and non smokers

### Exclusion Criteria

Pregnant women prescriptions  
Patients prescriptions with cerebrovascular attack  
Patients prescriptions with COPD  
The data was analysed to find out the prescribing pattern in hospital using the WHO prescribing indicators.

### WHO Prescribing indicators

1. Average number of drugs per encounter: Average, calculated by dividing the total number of different drug products prescribed, by the number of prescriptions surveyed.
2. Percentage of drugs prescribed by generic name: Percentage, calculated by dividing the number of drugs prescribed by generic name, by the total number of drugs prescribed, multiplied by 100
3. Percentage of prescriptions with an antihypertensive prescribed: Percentage, calculated by dividing the number of patient prescriptions during which an antihypertensive is prescribed, by the total number

of prescriptions surveyed multiplied by 100.

## RESULTS

A total of 284 prescriptions were collected and analysed. A total of 711 drugs were prescribed. The case files studied were in the age group of 18 to 89 years. The age group from 60 -69 years have more prescriptions (Table 1). The prescription pattern has slight male predominance. Average number of antihypertensive drugs per prescription was 2.5.

Diuretics were the most commonly prescribed antihypertensives followed by ACEIs,  $\beta$ -blockers, CCBs, ARBs,  $\beta$ -blockers with  $\alpha$  blocking property and Vasodilators (Table 5).

Among the diuretics, Furosemide prescribed by trade name was 58.8% and by generic name was 0.3%. Among ACEI, Ramipril was prescribed by trade name 21% and by generic name 3.5% (Table 3).

Antihypertensive two drug combination was 40.49%, and monotherapy accounted for 38.73 % and the remaining prescriptions were with more than two drugs (Table 2).

Among the fixed dose drug combinations prescribed were Telmisartan + HCTZ (7.7%), Spironolactone + Torsemide (5.28%), Furosemide + Spironolactone (4.2%) and Amlodipine + HCTZ (0.3%) (Table 4).

## DISCUSSION

One quarter of world's population has hypertension, this is likely to increase by 1.5 billion by 2025.<sup>[15]</sup> The prevalence of hypertension in india is highest in age group of 50-59.<sup>[15]</sup> Our study has shown maximum number of patients belong to age group 60-69 (among inpatients in cardiology unit). In the cardiology among in-patients, diuretics were the most commonly prescribed, followed by ACE inhibitors,  $\beta$ -blockers, Calcium channel blockers, Angiotensin receptor blockers,  $\beta$ - $\beta$ blockers with a blocking property and Vasodilators. The demographic results of patients admitted to cardiology unit over a period of 12 months revealed male preponderance.

A prescription based survey is considered to be one of the most effective methods to assess and evaluate the prescribing attitude of physicians and dispersing practise of pharmacists. As hypertension is very common, various treatments were available and different physicians prescribe different drugs. Even in different tertiary care hospital different pattern of various drugs are prescribed in patient population. Keeping the above in mind, the present study was undertaken to generate valid data for evaluation of prescribing pattern in cardiology unit at tertiary care hospital.

Among the diuretics, most commonly prescribed was Furosemide because in congestive heart failure there will be volume overload. ACE inhibitor Ramipril was prescribed and it had protective effect on diabetic nephropathy and remodelling of heart. The frequency of prescription of ACEI was high in co-morbid conditions.

Angiotensin Receptor Blockers are the new drugs with less side effects like decreased cough compared to ACEI were prescribed less frequently. Study from other centres ARB's were comparatively more. [2,7,12,16]

Drug prescription pattern of our study showed that two drug therapy was mostly prescribed when compared to monotherapy followed by three or more drug combination (polypharmacy). In two drug therapy diuretic and ACEI were commonly prescribed. This may be attributed to adherence of most prescribers to antihypertensive guidelines which recommend a diuretic and ACEI (Angiotensin converting enzyme inhibitor) as initial therapy. [17,18] The prescription of more drugs (polypharmacy) for one patient may be attributed to the possibility of some patients presenting with multiple disease conditions.

Prescribing pattern by generic name reduces the cost of treatment and should be encouraged.

**CONCLUSION**

From the above study it was observed that most hypertensive patients are treated with two drug combination (Diuretic and ACEI) followed by monotherapy. Angiotensin receptor blockers are underprescribed in this study.

The limitation of this study was that all the prescriptions were collected from inpatient from a single hospital and it may not represent the prescription pattern across the city. Further studies focussed on the rationale for choice of drugs based on demographic data, economic status, associated conditions and complications would give additional insights into prescribing patterns in hypertension in this area.

**ACKNOWLEDGEMENT**

We are thankful to Principal, Medical superintendent, Medical Record section and Management of Chalmeda Ananda Rao Institute of Medical Sciences, Karimnagar for giving us the permission to carry out this study.

**CONFLICT OF INTEREST : Nil**

**FUNDING : Nil**

**Table 1: Demographic characteristics of HTN Patients**

Age	Male	Female	Total
< 30	5	2	7
30-39	18	17	35
40-49	21	18	39
50-59	36	13	49
60-69	50	52	102
70-79	32	9	41
80-89	4	7	11

**Table 2: Monotherapy and Combination therapy (Number of prescriptions) (Percentage)**

Monotherapy = 110 (38.73%)	Three drug combination = 52 (18.30%)
Diuretics = 73	Diuretic+ACEI+ β blockers = 17
CCB = 18	Diuretic+ a-β blockers +ACEI = 9
Betablocker = 10	Diuretic +ARB+ a-β blockers = 3
ARB = 6	Nitrates+β blockers+ACEI = 5
ACEI = 3	Diuretic +Betablocker+CCB = 4
Two drug combination= 115 (40.49%)	Diuretic+ARB+CCB = 3
Diuretics +ACEI = 32	Diuretic+ β blockers+Nitrates = 3
Diuretics+CCB = 22	Diuretic +Nitrates+ACEI = 2
Diuretics +Betablockers = 18	Diuretic +ARB+Nitrates = 1
Diuretics +a-β blockers = 9	Diuretic+ACEI+ARB = 1
β-blockers+ACEI = 8	Diuretic+ACEI+ CCB = 1
Diuretics +ARB = 7	Diuretic+ a-β blockers +CCB = 1
CCB+ βblocker = 4	Diuretic+ a-β blockers +Nitrates = 1
CCB+ ARB = 4	Nitrates+βblockers+ARB = 1
Diuretics + Nitrates = 4	Four drug combination= 6 (2.11%)
β-blockers + Nitrates = 3	Diuretic +β-blocker+ACEI+Nitrates = 2
ACEI + Nitrates = 2	Diuretic +β-blocker+ACEI+ARB = 1
ARB +Nitrates = 2	Diuretic +β-blocker+ACEI+CCB = 1
CCB + ACEI = 1	Diuretic +β-blocker+ARB+Nitrates = 1
	Diuretic +β-blocker+CCB+Nitrates = 1
	Five drug combination =1(0.35%)
	Diuretic +a-β-blocker+ARB+Nitrates+ACEI = 1

CCB – Calcium channel blockers; ARB – Angiotensin receptor blockers; ACEI – Angiotensin converting enzyme inhibitors

Drugs Prescribed by generic name	Drugs Prescribed by Trade name
Furosemide = 1 (0.3%)	Lasix = 119 (41.9%)
Amlodipine = 7 (2.4%)	Telma = 15 (5.2%)
Amlodipine + HCTZ = 1 (0.3%)	Telma – H = 22 (7.7%)
Metoprolol = 3 (1.05%)	Dytor plus = 15 (5.28%)
Aldactone = 37 (13.0%)	Dytor = 12 (4.2%)
NTG = 5 (1.76%)	Stamlo = 44 (15.4%)
Sorbitrate = 15 (5.2%)	Cardivas = 23 (8.09%)
Nimodipine =1 (0.3%)	Aten = 6 (2.1%)
Diltiazem = 3 (1.05%)	Met xl = 62 (21.8%)
Ramipril = 14 (3.5%)	Betaloc = 4 (1.4%)
Enalapril = 2 (0.7%)	Losar – H = 6 (2.1%)
	Amlokind = 4 ( 1.4%)
	Ramace = 70 (24.6%)
	Ismo = 1 (0.3%)
	Labetolol =1 (0.3%)
	Lacilactone = 12 (4.2%)

**Table 3 : Number of the drugs with fixed dose combination**

Telma H(Telmisartan 40mg + HCTZ 12.5mg) = 22 (7.7%)
Dytor Plus (Spironolactone + Torsemide) = 15 (5.28%)
(Amlodipine +HCTZ) = 1 (0.3%)
Lacilactone (Furosemide + Spironolactone) = 12 (4.2%)

HCTZ = Hydrochlorthiazide

**Table 4 : Percentage of prescribed monotherapy antihypertensives**

Sl. No	Drug class	Number of prescriptions	Percentage
1	Diuretics	225	79.2%
2	ACEI	86	30.2%
3	β-blockers	75	26.4%
4	CCB	60	21.1%
5	ARB's	43	15.1%
6	β- blocker with α-blocking property	24	8.4%
7	Vasodilators	21	7.3%

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