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Research Article

A PROSPECTIVE STUDY ON DRUG PRESCRIBING PATTERN IN HYPERTENSIVE PATIENTS IN A TERTIARY CARE TEACHING HOSPITAL AT HYDERABAD

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A B S T R A C T

Background: Irrational drug prescribing is a common practice globally; it results in increased morbidity, mortality & economic burden on society. Drug utilisation studies are an important tool to promote rational prescribing.
Aims & Objective: To study on drug prescribing pattern in hypertensive patients.
Materials and Methods: A drug utilisation study was conducted in hypertensive patients by the department of pharmacology in medicine OPD at OHRC, Hyderabad, Telangana for 2 months. 153 prescriptions were evaluated for prescribing pattern by using WHO drug use indicators.
Results: 153 prescriptions were analysed. A total of antihypertensive drugs were prescribed. 60 angiotensin receptor blockers (ARBs), 8 angiotensin converting enzyme (ACE) inhibitors, 43Beta blockers, 43 Calcium channel blockers, 29 Fixed dose combinations (FDCs) of antihypertensives were included. 1.20 drugs were prescribed per prescription. 8 out of the total 15 antihypertensive drugs that were mentioned in the essential drug list 2016-17 were prescribed..
Conclusion: Most commonly prescribed drugs were ARBs and ACE inhibitors. Rational prescribing requires consideration of dose to duration and interaction with other medications.

INTRODUCTION

Hypertension is a major chronic diseases resulting in high mortality and morbidity worldwide.[2,3] It is a leading risk factor for coronary heart disease, stroke and chronic renal disease. Evidence from clinical trials suggests that lowering blood pressure effectively prevents these adverse outcomes.[4,5] Selection of antihypertensive agents should be based primarily on their comparative ability to prevent these complications. It is therefore important that once the diagnosis is established, blood pressure should be adequately controlled through regular follow-up, lifestyle modification, exercise and effective antihypertensive drugs.[6] The study of prescribing pattern is a component of medical audit which seeks monitoring, evaluation and necessary modifications in the prescribing practices to achieve rational and cost effective medical care. Therefore, drug utilization studies, which evaluate and analyze the medical, social and economic outcomes of the drug therapy, are more meaningful and observe the prescribing style of physicians with the aim to provide drugs rationally.

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Keeping all these facts in consideration, the present study was designed to analyze the prescribing patterns of antihypertensive drugs in a tertiary care teaching hospital in Hyderabad, Telangana.

Table no 1 Anti hypertensive drugs mentioned in essential drugs list 2016-2017

Anti Hypertensive Drugs Mentioned In Essential Drugs List 2016-2017		
S.no	**Name of the drug**	**Doses**
	Amlodipine	5 mg and 10 mg tabs
	Atenolol	50 mg and 100 mg tabs
	Diltiazem	30 mg tab
	Clonidine	100 mcg tab
	Enalapril	2.5 mg and 5 mg tab
	Labetalol	100 mg tab and 20 mg inj
	Losartan	50 mg tab
	Methyldopa	250 mg tab
	Metoprolol	1 mg inj, 50 mg tab
	Nifedipine	5 mg cap and 10 mg tab
	Propanolol	10mg and 40 mg tabs
	Ramipril	2.5 mg and 5 mg tabs
	Telmisartan	40 mg tab

MATERIALS AND METHODS

A prospective drug utilization study was conducted in hypertensive patients by the Department of Pharmacy Practice

in Medicine OPD at OHRC, hyderabad, Telangana. Approval of the Institutional Ethics Committee was obtained prior to the commencement of the study. A total of 153 prescriptions were analysed to evaluate the prescribing pattern in hypertensive patients. Prescriptions were assessed using WHO drug indicators like drug class, dosage form, fixed dose combinations (FDCs) and drugs from National Essential Medicine List 2016-17.

Frequency of utilization of antihypertensive medications was charted. The fixed dose combinations of antihypertensive drugs were also assessed. The antihypertensives prescribed from Essential Medicine List were also assessed.

RESULTS

Demographic Profile

During the entire study period, a total of 153 prescriptions were assessed. 59 were male and 94 were female patients. The mean age of patients was 54.14 ±1.09 years.

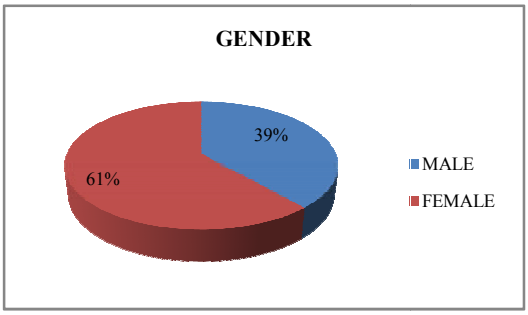

Figure 1 Number of male patients and female patients

Table 2 Demographic profile Parameters

Parameters	Number	Percentage
Males	59	39%
Females	94	61%
Mean Age	54±1.9	-
Addictions	Smokers	14%
	Ethanolic	9%
	Pan/Zarda	41%
Co-Morbid Conditions	DM	78%
	CAD	23%
	CKD	21%
	THYROID	10
	MISCELLANEOUS	7

History of addiction to either smoking or alcohol was present in 64. Co-morbid conditions associated with Hypertension included

- Type 2 Diabetes mellitus in 78
- Hypothyroidism in 10
- Coronary artery disease in 23
- Chronic kidney disease in 21
- Epilepsy in 1
- Cancer in 1
- Arthritis in 1
- Pregnancy induced Hypertension in 1 and
- Bronchial Asthma in 1 patients.

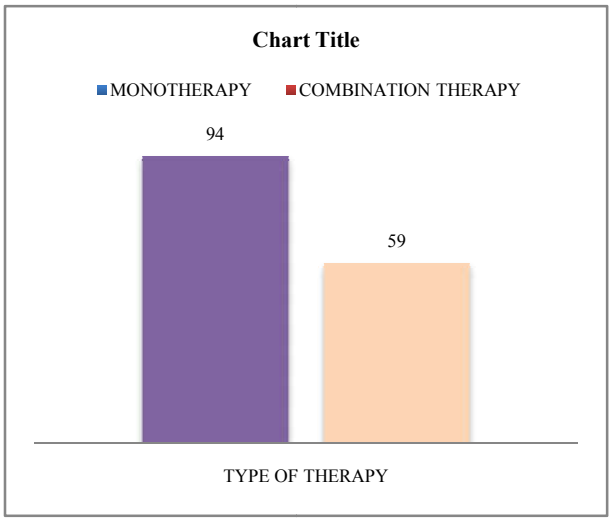

Figure no 2 Type of therapy

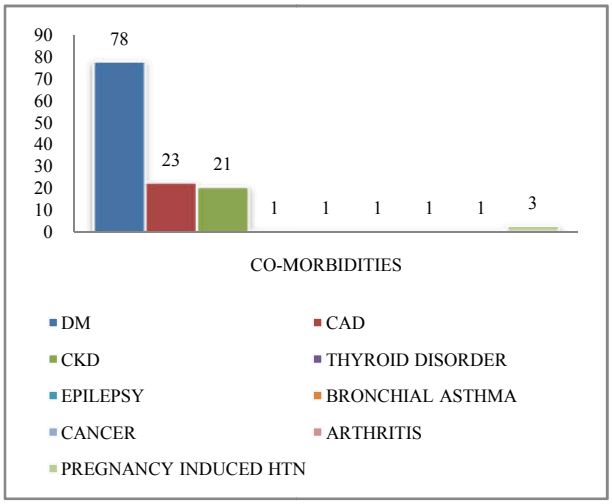

Figure no 3 -Co-morbid conditions associated with Hypertension in this study group of patients.

Antihypertensive Drugs Prescribed

A total of 153 antihypertensive drugs were prescribed.

- Angiotensin Receptor blockers (ARBs) were 60
- ACE inhibitors were 8
- β blockers were 43
- Ca channel blockers were 43
- Diuretics were 20
- K channel opener was 1
- α blockers were 1
- α+β blockers were 4
- Sympathetic inhibitors were 5.

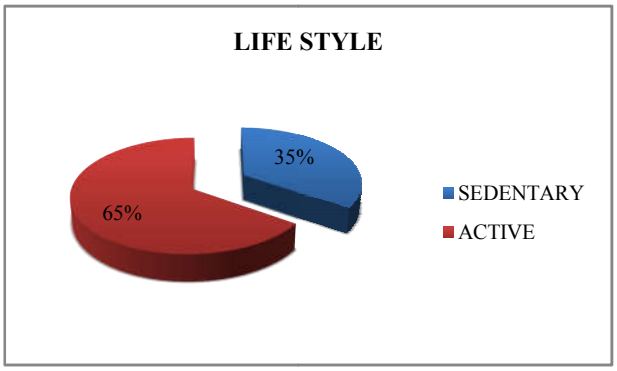

Figure 4 Lifestyle of the patients

Table 3 Total antihypertensives prescribed

Drug Class	Number	Percentage
Diuretics	20	11%
Calcium Channel Blockers	43	23%
Potassium Channel Openers	43	23%
β - BLOCKERS	1	5%
Angiotensin Converting Enzyme Inhibitors	8	4%
Angiotensin Receptor Blockers	60	32%
α- BLOCKERS	1	5%
α + β BLOCKERS	4	2%
Sympathetic Inhibitors	5	2%
Total	185	100%

Table no 4 Anti hypertensive drugs prescribed during the study period.

Drugs	Number	Percentage
Amlodipine	43	23%
Atenolol	19	10%
Enalapril	6	3%
Losartan	9	5%
Metoprolol	24	13%
Clonidine	5	3%
Ramipril	2	1%
Telmisartan	46	25%
Hydrochlorthiazide	18	10%
Chlorthiazide	2	1%
Carvedilol	2	1%
Olmesartan	5	3%
Nebivolol	2	1%
Prazosin	1	0.5%
Nicorandil	1	0.5%
Indapamide	1	0.5%
Total	185	100%

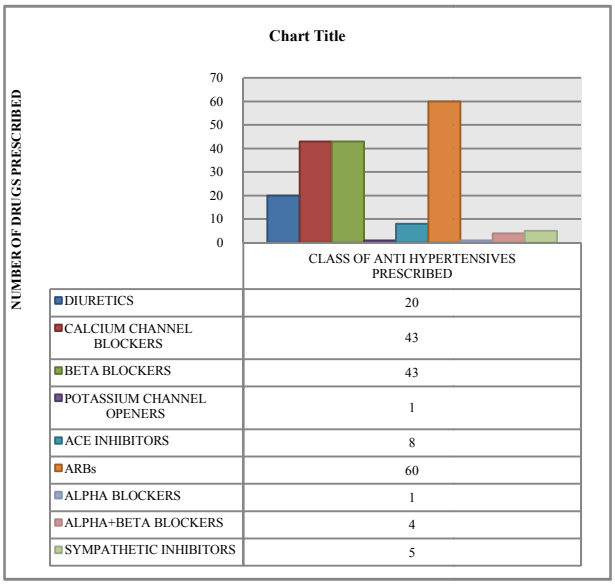

Figure 5 Different drug class prescribed over the study period

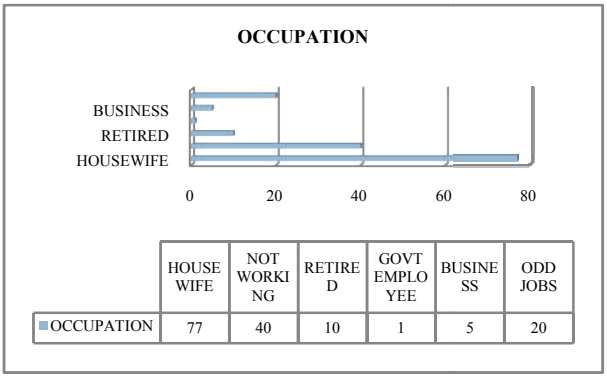

Figure 6 Occupation of the patients

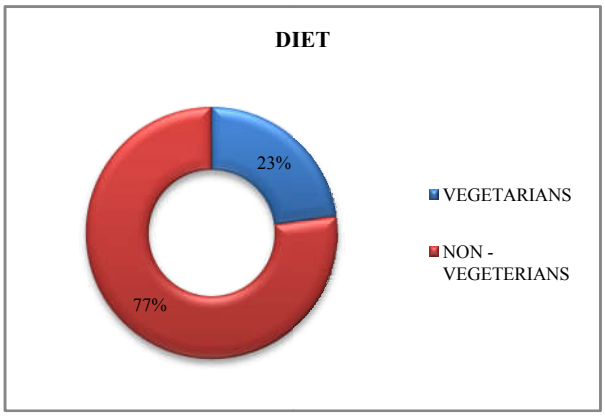

Figure 7 Diet of the patients

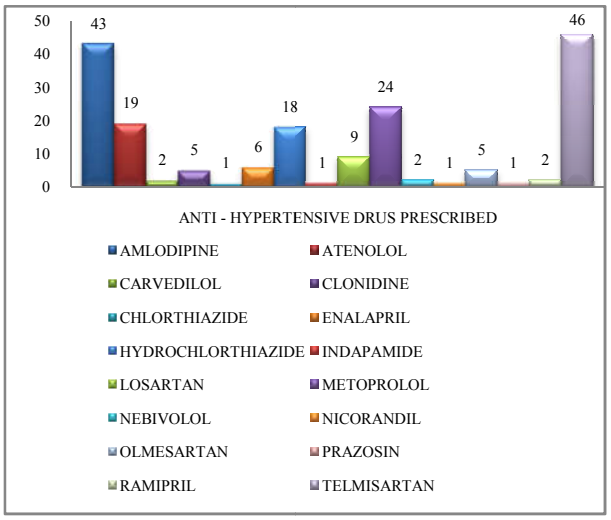

Figure 8 Total Antihypertensives Prescribed

Table 5 Fixed drug combinations

Combination drugs	Number	Percentage
Telmisartan + Hydrochlorthiazide	17	10%
Atenolol + Amlodipine	8	5%
Losartan + Hydrochlorthiazide	4	3%
Total	29	19%

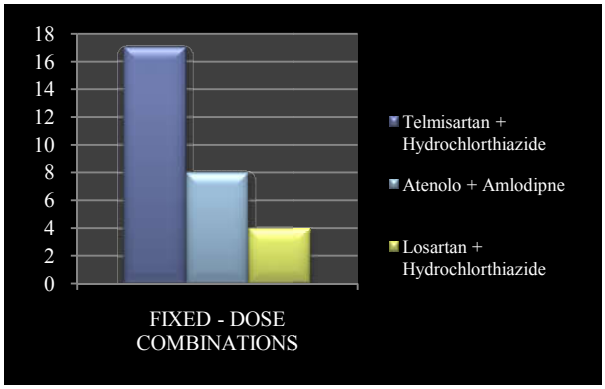

Figure no 9 Fixed dose combinations prescribed in this study

Total 29 FDCs were prescribed. Amongst ARBs, the leading drugs were Telmisartan 46 (25%), Losartan 9(5%) and Olmesartan 5(3%). Amongst ACE inhibitors the most commonly prescribed drug was Enalapril 6 (3%) followed by Ramipril 2(1%). Metoprolol 24 (13%) was the most commonly prescribed Beta blocker followed by Atenolol 19 (10%) and Nebivolol 2 (1%). Amlodipine 43 (23%) was the

only Calcium channel blocker prescribed. Out of 29 fixed dose combinations, most common was Two drug combination of Telmisartan Hydrochlorthiazide 17 (10%) followed by Amlodipine and Atenolol 8 (5%), Losartan and Hydro-chlorthiazide 4(3%).

Table 6 Antihypertensives prescribed from National Essential Medicine List 2016-17

Drugs	Number	Percentage
Amlodipine	43	23%
Atenolol	19	10%
Enalapril	6	3%
Losartan	9	5%
Metoprolol	24	13%
Clonidine	5	3%
Ramipril	2	1%
Telmisartan	46	25%
Total	154	83%

The average number of drugs prescribed per prescription was 1.20, all drugs were prescribed by oral formulations and 100 % drugs were prescribed by their brand names.

DISCUSSION

A prescription based survey is one of the most effective methods to assess and evaluate the prescribing style of the physicians and dispensing practice of pharmacists.[9] It is also important to consider the recommendations of international bodies that help to improve prescribing practice of the physicians and ultimately, the clinical standards. A continuous supervision through systematic audit, which provide feedback from the physician and help to promote rational use of drugs.[10]

The present study observed that incidence of hypertension was higher in females, that was not comparable to the earlier studies on hypertensive patients.[11,12] The average age of patients in the present study was 54.14 ± 1.09 years, reflecting usual age group of disease manifestation. This was comparable to the age of patients in two studies - 52.3 years and 52.93 years.[13,14]

The pattern of hypertension is changing in our country due the change in life style and food habits.[15] In the present study, the most commonly prescribed antihypertensive agents were Angiotensin Receptor Blockers and Angiotensin Converting Enzyme Inhibitors, which was comparable with a previous study by Elliott WJ *et al*. The coexisting diseases were Diabetes mellitus, Coronary artery disease and Hypothyroidism, and co-prescribed drugs were antidiabetics, statins and thyroid hormones. As the most common coexisting disease was Type 2 Diabetes mellitus, the prescription of ARBs and ACE inhibitors seems justified as these drugs have a protective role in diabetic patients.

Previous reports from in vivo studies have revealed that inhibitors of renin angiotensin system have reduced the incidence of new onset diabetes in hypertensive subjects apart from the adequate blood pressure control.[16] These drugs are known to decrease the onset and progress of microvascular complication of hypertension and diabetes mellitus as per the previous studies.[17] In the present study diuretics were not used in monotherapy. Underutilisation of diuretics has been reported from time to time. A study by Preethi G Pai *et al*. has shown decline in prescribing trend of diuretics.[18] Lesser use of diuretics in the present study may be correlated to adverse effects of diuretics on glucose homeostasis and lipid profile.[19] Earlier studies also suggested that an ideal combination therapy must include antihypertensive drugs possessing complementary mechanism of action that possess synergistic anti-hypertensive effects without any adverse effects, at low doses.[10] Furthermore, the antihypertensive drug combination therapy should be able to reduce or counteract the reflex compensatory mechanism that limit the fall in blood pressure.[20] In this study two drug therapy was more commonly prescribed than three drug therapy. In the two drug combination, a beta blocker (Atenolol) with calcium channel blocker (Amlodipine) was most often prescribed which was comparable with other study by H Tiwari *et al*.[10,17] Overall, 29(15%) patients in our study received fixed dose combinations. This may be an attempt to improve patient compliance and reduce treatment costs. Such trend of FDCs in hypertension has also been reported in some other studies in India. Average number of drugs prescribed per patient was 1.20 which was less compared to previous study where 3.97 drugs were prescribed per prescription.[21] In our study all drugs were prescribed by their brand names, poor prescribing of generic drugs can be because of concern about their quality.

Table no 7 Frequency of administration of individual drugs

Anti – Hypertensive Drugs	Prescribed During The Study Period
Diuretics	Hydrochlorthiazide, Chlorthiazide, Indapamide
Calcium Channel Blockers	Amlodipine
Potassium Channel Openers	Nicorandil
β – Blockers	Atenolol, Metoprolol
Angiotensin Converting Enzyme Inhibitors	Enalapril, Ramipril
Angiotensin Receptor Blockers	Telmisartan, Olmesartan, Losartan
α- Blockers	Prazosin
α + β Blockers	Carvedilol, Nebivolol
Sympathetic Inhibitors	Clonidine

CONCLUSION

To conclude, most of the prescriptions were found to be rational, but further improvement is needed. Further studies focussed on rationale for choice of drug based on demographic data, economic status, associated conditions and complications would give additional insights into prescribing patterns in hypertension in India. Rational prescribing must consider dose, duration and interaction with other medications. A therapeutic audit with more parameters of analysis to provide regular feedback to researchers and prescribers may encourage rational prescribing in hypertension.

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