

DRUG UTILISATION IN THE MANAGEMENT OF HYPERTENSION IN A TERTIARY CARE HOSPITAL

Shahana Begum*, Dr. J. Raghuram and Sumaiya Fatima

Department of Pharmacology, Sultan-UI-Uloom College of Pharmacy, Hyderabad, Telangana State, India.

*Corresponding Author: Shahana Begum

Department of Pharmacology, Sultan-UI-Uloom College of Pharmacy, Hyderabad, Telangana State, India.

Article Received on 29/11/2018

Article Revised on 20/12/2018

Article Accepted on 10/01/2019

ABSTRACT

Aim: The Present aim is to assess the for drug utilisation in the management of hypertension at Aster Prime Hospital (Hyderabad). **Methodology:** The observational study is undertaken in drug utilisation in the management of hypertension indoor patient department in a tertiary hospital for a period of eight months for auditing of prescriptions and drug utilisation, during which data of 180 patients was collected. The study included all patients prescribed with antihypertensive drugs across all departments during the study period. **Results:** In our study we conclude that number of patients receiving:

- Monotherapy of antihypertensive drugs, Amlodipine was the most commonly used drug which was prescribed for 89 (49.44%) patients were found to be most rational and Galantamine was found to be semi rational.
- Number of patients receiving two drug combination therapy of antihypertensive drugs 36 (20%) patients. Amlodipine + atenolol was most commonly prescribed two drug combination which was prescribed for 7 patients (3.88%).
- Number of patients receiving three drug therapy of antihypertensive drugs out of 180 prescriptions three drugs were prescribed for 20 (11.11%) patients. In that losartan + hydrochlorothiazide + amlodipine and Enalapril + Amlodipine + Hydrochlorothiazide were the most commonly prescribed three drug combinations prescribed.
- The four drug combinations were the least prescribed. Four drugs were prescribed only for 8 (4.44%) patients. Hydrochlorothiazide + Telmisartan + Amlodipine + Atenolol and Telmisartan + Hydrochlorothiazide + Metoprolol + Amlodipine were the two four drug combinations prescribed for 8 patients.

KEYWORDS: Drug utilisation, rational, semi-rational, irrational, Monotherapy, combination therapy, prescribe.

INTRODUCTION

The Prescription drugs (antihypertensive drugs) have gotten to be a vital apparatus to treat and manage hypertension, and in the past decade utilization for drugs has dramatically increased. Drug expenditures are the fastest growing component of total health care expenditures, and there is no sign of this trend abating (Mullins 2001). In response to these growing costs, insurers have drastically reduced the drug facilitates they incur, causing patient out-of-pocket costs for drugs to soar, and creating difficult figures for patients as they evaluate the trade-off between their billfold and their health. For many people this trade-off may not be extreme, but since drug therapy is the standard treatment for managing hypertension, the interruption or lack of drug therapy can often have genuine wellbeing consequences. Thus, the patient may be particularly vulnerable to changes in utilization mediated by mismanagement of antihypertensive drugs.

Hypertension is a long chronic condition to affect as it is responsible for basic cause of heart diseases and Diabetes Mellitus. It is a risk factor causing to cardiovascular complications. Hypertension is defined according to JNC 8 and WHO/ISH guidelines as systolic blood pressure of ≥ 140 mm Hg and diastolic blood pressure of ≥ 90 mm Hg, though the risk appears to increase even with blood pressure above 120/80 mm Hg.

AIMS AND OBJECTIVES

The Present aim is to assess the for drug utilisation in the management of hypertension at Prime Hospital (Hyderabad).

- The prescriptions of antihypertensive drugs depending on type of therapy whether monotherapy or combination therapy.
- Prescribing drugs by brand names or generic names.
- Rationality of antihypertensive drugs prescribed.
- The ADRs pattern for antihypertensive drugs.

METHODOLOGY

Prime Hospital from November 2017 to June 2018, Prime Hospital is a private teaching hospital and a state referral centre for Hyderabad with a bed capacity of 1,500 beds positioned to serve patients from different parts of the country and is, in effect, the apex of the private health service hierarchy in Hyderabad. Hyderabad is the capital of the southern Indian state of Telangana and de jure capital of Andhra Pradesh. with approximately 6.7 million and a metropolitan population of about 7.75 million, making it the fourth most populous city and sixth most populous urban agglomeration in India.

Study design

This was a prospective cross section hospital based study conducted for 8 months from November 2017 to June 2018.

Study population

The study included all patients prescribed with antihypertensive drugs across all departments during the study period.

Sample size

Sample size was convenient sampling in which all patients who were prescribed with antihypertensive drugs across all departments were included. Total prescriptions done were 180 included in the study.

Sampling Technique

Convenient enrolment technique was employed in which all patients in across all departments who were prescribed with antihypertensive drugs in Prime Hospital from November 2017 to June 2018 were enrolled.

Study procedure

Prior to data collection the hospital administration visited to explain the purpose of the study. The principal investigator made a pre-test of the questionnaire and were responsible for data collection. Audit of elective prescriptions was done by collecting information. A Structured questionnaire was used to collect information.

Monitoring

Research information was gathered everyday and followed, and the resources, quality/quantity of activities reviewed frequently. This helped to identify gaps and problems which could be solved early and avoid affecting the research.

Data processing and analysis

Data recorded on the data collecting tool was processed and checked for completeness and consistency using SPSS version 16 program followed by data cleaning and coding then data analysis using frequency tables and cross tabulation with respective statistical tests. After analysis of the data followed by interpretation, report was written and presented.

Limitation of the study

The study was done at single institution. The study does not involve other public/private hospitals.

RESULTS

The present cross-sectional study of drug utilization pattern and adverse drug reaction profile of antihypertensive drugs was done at the Prime Hospital (Hyderabad), for a period of 8 months. Total of 180 prescriptions and 118 ADRs were collected and analysed. In this study it was noted that in all prescriptions lifestyle modifications were recommended for all patients with hypertension irrespective of antihypertensive drug therapy. In all the prescriptions recorded, the route of administration of antihypertensive drugs was oral.

Age distribution of patients studied

In the current study out of 180 patients, 67 patients (35.55%) belonged to age group of 61-75 years. There were 75 patients (34.44%) in age group of 51-60 years, 8 patients (3.88%) in age group of 76-80 years, 26 patients (13.33%) in age group of 41-50 years and 4 patients (1.66%) in age group of 81-90 years.

Gender distribution of patients studied

In the current study out of 180 patients, 117 (65%) were male and 63 (35%) were female.

Body mass index of patients studied

Calculation of body mass index showed that out of 180 patients, 52 (28.88%) were of normal weight, 108 (60%) were overweight and 20 (11.11%) were underweight.

Table 1: Age, Gender and Body mass index distribution of patients studied.

Sl. no.	Demographics		Number of patients
1.	Age in years		
	i.	41 - 50	26
	ii.	51 - 60	75
	iii.	61 - 75	67
	iv.	76- 80	8
	v.	81 - 90	4
2.	Sex		
	i.	Male	117
	ii.	Female	63
3.	Body mass index in Kg/m²		
	i.	Underweight (<18.5)	20
	ii.	Normal weight (18.5 – 24.9)	52
	iii.	Overweight (25 – 29.9)	108

Concomitant conditions

In our study, out of 180 patients, 147 had concomitant conditions. 64 (43.53%) were suffering from diabetes mellitus. Other concomitant conditions were COPD in 25 patients (17%), Diabetes Mellitus + Chronic Obstructive Pulmonary Disease in 26 patients (17.68%), Coronary Artery Disease in 15 patients (10.20 %), Dyslipidaemia

in 4 patients (2.72 %), Cerebral Vascular Accident in 3 patients (2.04 %), Mitral stenosis in 5 patients (3.40 %) and Hypothyroidism in 5 patient (3.40 %).

Table 2: Concomitant conditions of the patients studied.

Concomitant conditions of the patients studied		Number of patients
i.	Diabetes Mellitus	64
ii.	Chronic Obstructive Pulmonary Disease	25
iii.	Diabetes Mellitus + Chronic Obstructive Pulmonary Disease	26
iv.	Coronary Artery Disease	15
v.	Dyslipidaemia	4
vi.	Cerebral Vascular Accident	3
vii.	Hypothyroidism	5
viii.	Mitral stenosis	5

Drugs prescribed by generic and brand name

In the present study, in all the 180 prescriptions, all the antihypertensive drugs were prescribed by brand names.

Table 3: Prescriptions of antihypertensive drugs by generic and brand names.

Prescriptions	Branded drugs	Generic drugs
	180	0

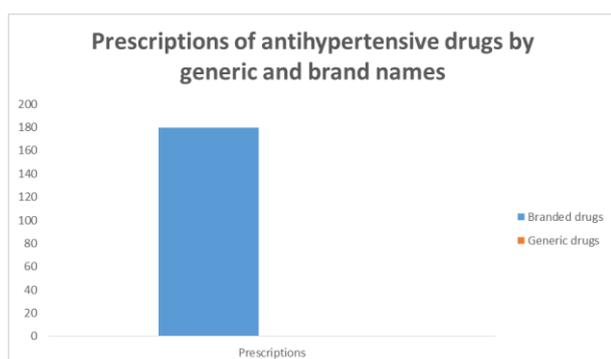


Figure 1: Number of patients receiving monotherapy or combination drug therapy of antihypertensive drugs.

In our study, there were total 180 prescriptions of antihypertensive drugs. Among 180 prescriptions, 111 (62%) were monotherapy and 69 (38%) were combination therapy. Among the prescriptions of antihypertensive drugs as combination therapy 36(20%), 20 (11.11%) and 8 (4.44%) were combination of two, three and four drugs respectively.

Table 4: Percentage of prescriptions of antihypertensive drugs as monotherapy and combination therapy.

Percentage of Prescriptions	Monotherapy	Combination therapy
	62%	38%

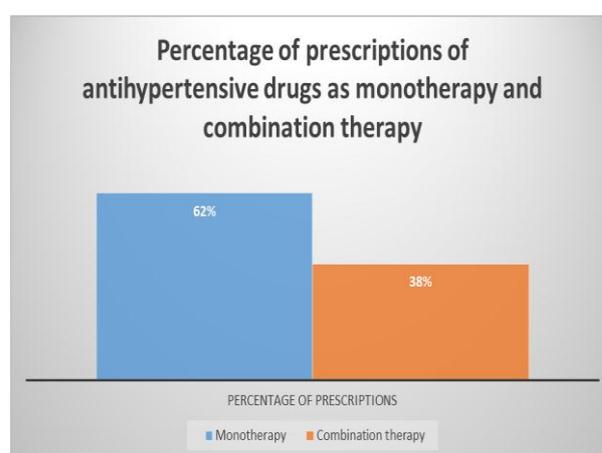


Figure 2: Number of patients receiving monotherapy of antihypertensive drugs.

In present study 111 (62%) patients had received single drug for the treatment of hypertension. Amlodipine was the most commonly used drug which was prescribed for 89 (49.44%) patients. Other drugs prescribed as monotherapy were ramipril for 5 (2.77%) patients, nifedipine for 3 (1.66%) patients, telmisartan for 3 (1.66%) patients, metoprolol for 5 (2.77%) patients, losartan for 2 (1.11%) patient, nebivolol for 2 (1.11%) patient and furosemide for 2 (1.11%) patient.

Table 5: Antihypertensive drugs prescribed as monotherapy.

Monotherapy Drug Prescribed	Number of prescriptions
Amlodipine	89
Nifedipine	3
Ramipril	5
Telmisartan	3
Losartan	2
Metoprolol	5
Nebivolol	2
Furosemide	2

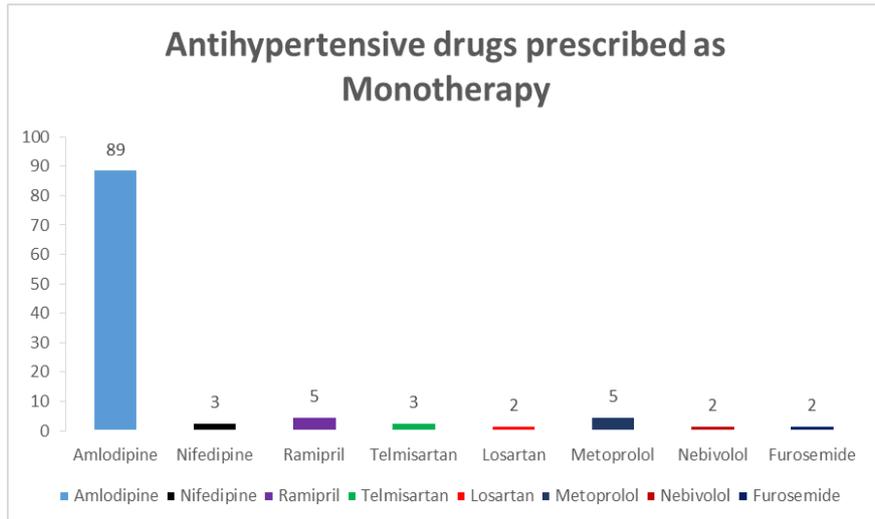


Figure 3: The number of prescriptions of antihypertensive drugs as monotherapy.

Number of patients receiving two drug combination therapy of antihypertensive drugs

Out of 180 patients two drugs were prescribed for 36 (20%) patients. Amlodipine + atenolol was most commonly prescribed two drug combination which was prescribed for 7 patients (3.88%). Other two drug combinations prescribed were amlodipine + furosemide

for 6 patients (3.33%), telmisartan + hydrochlorothiazide for 4 patients (2.22%), amlodipine + ramipril for 2 patients (1.11%), amlodipine + losartan for 2 patient (1.11%), telmisartan + amlodipine for 4 patient (2.22%), losartan + hydrochlorothiazide for 5 patient (2.77%), carvedilol + ramipril for 2 patient (1.11%) and amlodipine + nebivolol for 4 patient (2.22%).

Table 6: Antihypertensive drugs prescribed as two drug combination.

Two drug combination Prescribed	Number of prescriptions
Amlodipine + Atenolol	7
Amlodipine + Furosemide	6
Telmisartan + Hydrochlorothiazide	4
Amlodipine + Ramipril	2
Amlodipine + Nebivolol	4
Carvedilol + Ramipril	2
Losartan + Hydrochlorothiazide	5
Telmisartan + Amlodipine	4
Amlodipine + Losartan	2

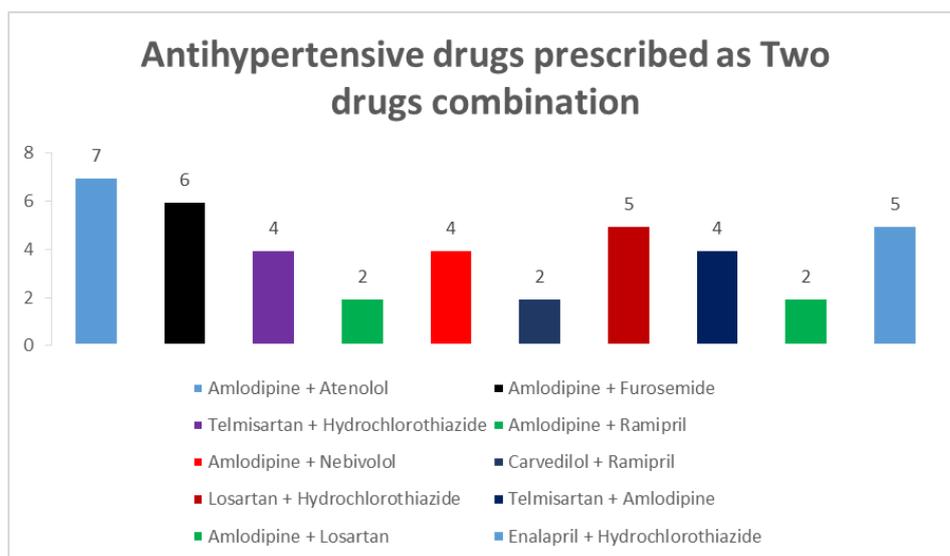


Figure 4: Antihypertensive drugs prescribed as two drug combination.

Number of patients receiving three drug therapy of antihypertensive drugs

Out of 180 prescriptions three drugs were prescribed for 20 (11.11%) patients. In that losartan + hydrochlorothiazide + amlodipine and Enalapril + Hydrochlorothiazide + Amlodipine were the most commonly prescribed three drug combinations

prescribed for 5 patients (2.77%) both respectively. Other three drug combinations prescribed were ramipril + amlodipine + atenolol for 2 patients (1.11 %), amlodipine + atenolol + furosemide for 3 patients (1.66 %), bisoprolol + ramipril + furosemide for 2 patients (1.11 %) and telmisartan + amlodipine + hydrochlorothiazide for 3 patient (1.66 %).

Table 7: Antihypertensive drugs prescribed as three drug combination.

Three drug combination Prescribed	Number of prescriptions
Ramipril + Amlodipine + Atenolol	2
Furosemide + Amlodipine + Atenolol	3
Bisoprolol + Ramipril + Furosemide	2
Telmisartan + Hydrochlorothiazide + Amlodipine	3
Losartan + Hydrochlorothiazide + Amlodipine	5
Enalapril + Hydrochlorothiazide + Amlodipine	5

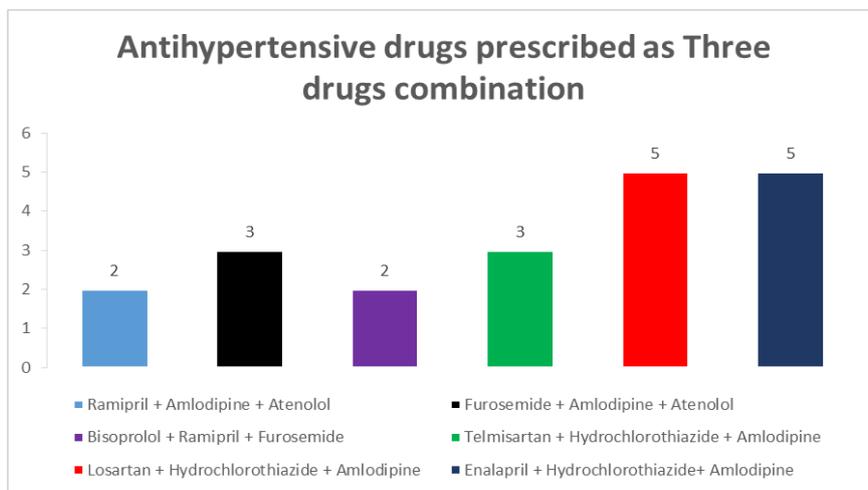


Figure 5: Antihypertensive drugs prescribed as three drugs combination.

Number of patients receiving four drug therapy of antihypertensive drugs

The four drug combinations were the least prescribed. Four drugs were prescribed only for 8 (4.44%) patients.

Hydrochlorothiazide + Telmisartan + Amlodipine + Atenolol and Telmisartan + Hydrochlorothiazide + Metoprolol + Amlodipine were the two four drug combinations prescribed for 8 patients.

Table 8: Antihypertensive drugs prescribed as four drugs combination.

Four drugs combination Prescribed	Number of prescriptions
Telmisartan + Hydrochlorothiazide + Metoprolol + Amlodipine	4
Hydrochlorothiazide + Telmisartan + Amlodipine + Atenolol	4

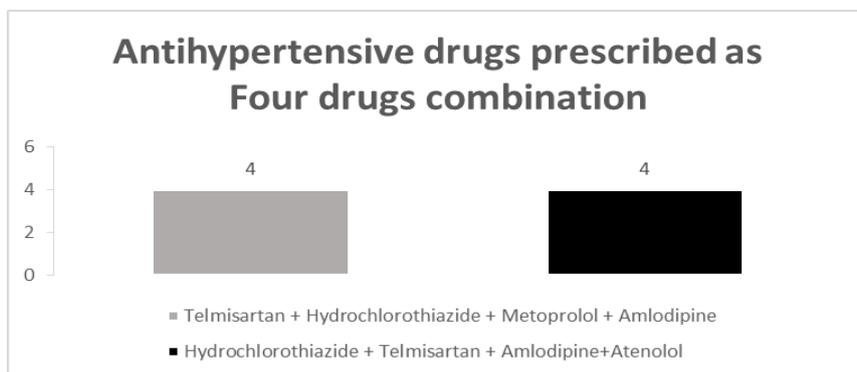


Figure 6: Antihypertensive drugs prescribed as four drugs combination.

Adverse drug reactions recorded

In present study it has been observed that 18 ADRs developed for different types of antihypertensive drugs during the period of eight months.

Gender distribution of patients developing ADRs to antihypertensive drugs

Among 118 patients who showed ADRs to antihypertensive drugs, 90 (76%) were female and 28 (24%) were male.

Table 9: Percentage of males and females who experienced ADRs due to use of antihypertensive drugs.

ADRs Reported	Percentage (n=118)
Males	24% (28)
Females	76% (90)

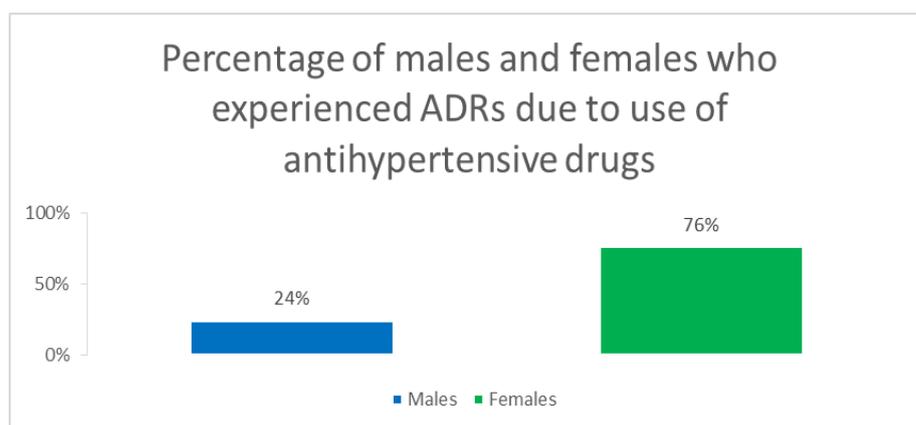


Figure 7: Percentage of males and females who experienced ADRs due to use of antihypertensive drugs.

Age distribution of patients developing ADRs to antihypertensive drugs

ADRs to antihypertensive drugs were observed most commonly in age group of 61–75 years (43.22%). Other age groups affected were 51–60 years (36.44%), 76–80 years (3.38%) and 41–50 years (16.94%).

Number of patients on monotherapy and combination therapy developing ADRs shown with antihypertensive drugs

Out of 118 patients who developed ADRs while receiving antihypertensive therapy, 76 (64.40%) were receiving monotherapy and 42 (35.59%) were receiving combination therapy.

Table 10: Age distribution of patients developing ADRs.

Sl.no.	Demography for ADRs		Number of patients
1.	Age in years		n=118
	i.	41 - 50	20
	ii.	51 - 60	43
	iii.	61 - 75	51
	iv.	76- 80	4
2.	Sex		
	i.	Male	28
	ii.	Female	90
3.	Therapy		
	i.	Monotherapy	76
	ii.	Combination therapy	42

ADRs shown on treatment with different classes of antihypertensive drugs

Calcium channel blockers were found to be the commonest therapeutic class of antihypertensive drugs associated with ADRs (61.01%). Other groups associated with ADRs were Angiotensin receptor blockers (15.25%), β-blockers (12.71%), Angiotensin converting enzyme inhibitors (3.38 %) and diuretics (7.62 %). Among individual drugs amlodipine was found to be the commonest drug associated with ADRs.

Table 11: ADRs experienced with different classes of antihypertensive drugs.

ADRs experienced	Number of patients
Calcium channel blocker	72
β - blockers	15
Diuretics	9
Angiotensin receptor blocker	18
Angiotensin converting enzyme inhibitors	4

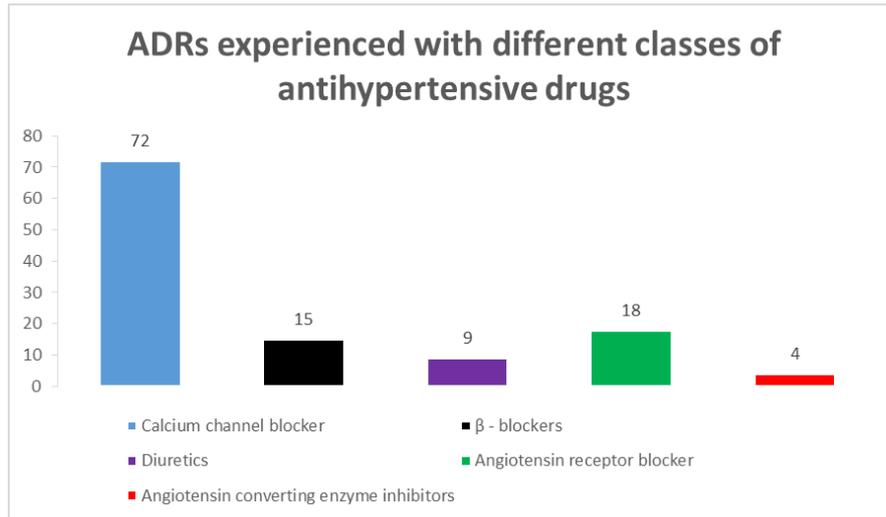


Figure 8: ADRs experienced with different classes of antihypertensive drugs.

ADRs to antihypertensive drugs affecting various systems

In our study ADRs to antihypertensive drugs associated with central nervous system (36.44%) were found to be the most frequent headache, dizziness, sedation and giddiness. Other systems associated with ADRs were

musculoskeletal system (29.66%) edema, fatigue and muscle cramp, respiratory system (13.55%) dry cough and breathlessness, gastrointestinal system (16.10%) abdominal pain and diarrhoea, cardiovascular system (4.23%) bradycardia.

Table 12: Organic System-wise distribution of ADRs by antihypertensive drugs.

Organic System ADRs experienced	Number of patients
Central nervous system	43
Musculoskeletal system	35
Respiratory system	16
Gastrointestinal system	19
Cardiovascular system	5

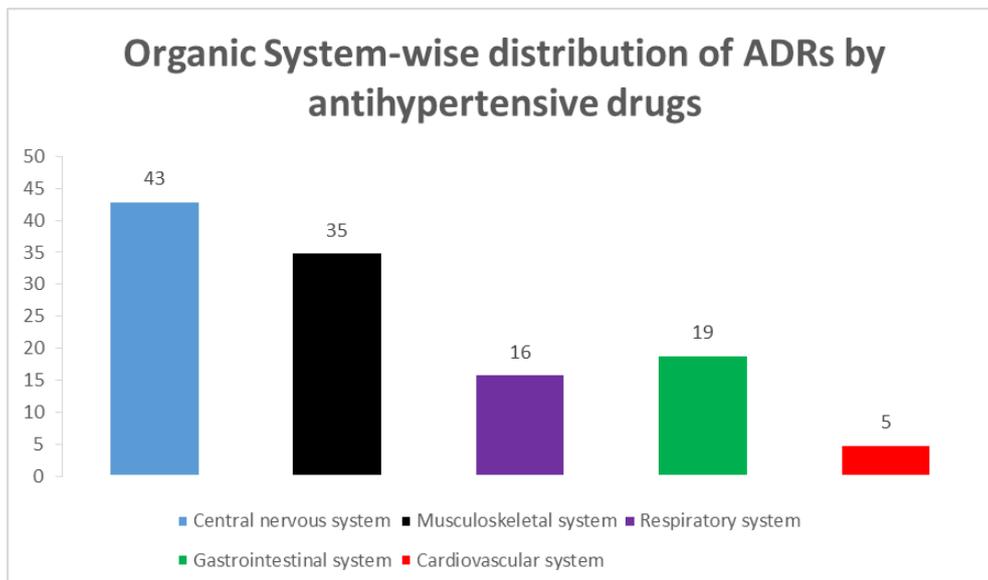


Figure 9: Organic System-wise distribution of ADRs by antihypertensive drugs.

CONCLUSION

Our cross-sectional study was undertaken to study the drug utilization pattern in patients with hypertension and to analyze the management of antihypertensive drugs.

The study was conducted for a period of 8 months. The data was collected using a case record form. The study included patients of all age group.

A total of 180 prescriptions of patients receiving antihypertensive drugs from Prime Hospital (Hyderabad) were collected. Commonest age range of the patients was 61-75 years. The incidence of hypertension in 117 (65%) were male and 63 (35%) were female. All the antihypertensive drugs were prescribed by brand name. Monotherapy (62%) was preferred more than combination therapy (38%). A total of 118 ADRs to antihypertensive drugs were also collected during the study period. Majority of the ADRs were in females 76% (90), followed by males 24% (28).

In our study we conclude the prescriptions were analysed and evaluated with the utilization of high end prescribing antihypertensive drugs and other preferred therapies were based on the JNC 8, ADA 2013, ISHIB, KDIGO, CHEP 2013 guidelines in multiple departments as agents to treat hypertension. The study also compares utilization of different types of antihypertensive therapies in other comorbid conditions, this has assessed hypertension control in this sample population of patients and also helped to assessed awareness about hypertension in the study sampling group.

REFERENCES

1. James PA, Oparil S, Carter BL, et al. 2014 evidence-based guideline for the management of high blood pressure in adults. report from the panel members appointed to the Eighth Joint National Committee (JNC 8). *JAMA*, 2013 Dec 18.
2. Weber MA, Schiffrin EL, White WB, et al. Clinical practice guidelines for the management of hypertension in the community: a statement by the American Society of Hypertension and the International Society of Hypertension. *J Clin Hypertens (Greenwich)* 2013 Dec 17. doi: 10.1111/jch.12237. [Epub ahead of print].
3. Beckett NS, Peters R, Fletcher AE, et al. Treatment of hypertension in patients 80 years of age or older. *N Engl J Med*, 2008; 358: 1887-98.
4. JATOS Study Group. Principal results of the Japanese trial to assess optimal systolic blood pressure in elderly hypertensive patients (JATOS). *Hypertens Res*, 2008; 31: 2115-27.
5. Ogihara T, Saruta T, Rakugi H, et al. Target blood pressure for treatment of isolated systolic hypertension in the elderly: valsartan in elderly Isolated systolic hypertension study. *Hypertension*, 2010; 56: 196-202.
6. *PL Detail-Document*, Hypertension in the Elderly: Pharmacotherapy Focus. *Pharmacist's Letter/Prescriber's Letter*. June 2011.
7. Curb JD, Pressel SL, Cutler JA, et al. Effect of diuretic-based antihypertensive treatment on cardiovascular disease risk in older diabetic patients with isolated systolic hypertension. Systolic Hypertension in the Elderly Program Cooperative.
8. Tuomilehto J, Rastenyte D, Birkenhager WH, et al. Effects of calcium-channel blockade in older patients with diabetes and systolic hypertension. Systolic Hypertension in Europe Trial Investigators. *N Engl J Med*, 1999; 340: 677-84.
9. UK Prospective Diabetes Study Group. Tight blood pressure control and risk of macrovascular and microvascular complications in type 2 diabetes: UKPDS 38. *BMJ*, 1998; 317: 703-13.
10. ACCORD Study Group, Cushman WC, Evans GW, et al. Effects of intensive blood pressure control in type 2 diabetes mellitus. *N Engl J Med*, 2010; 362: 1575-85.