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Original Research Article

Study on drug utilization pattern of antihypertensive medication in tertiary care hospital of Telangana, India

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ABSTRACT

Background: Hypertension is leading cause of deaths in the world. It is the major risk factor for systemic disorders including cardiovascular, renal and brain disorders. A drug utilization review on antihypertensive drugs should be done to determine different classes of antihypertensive medications with respect to diagnosis. Aim was to study drug utilization pattern of antihypertensive medication in a tertiary care hospital, Telangana.

Methods: A cross sectional observational study was done in the patients with hypertension for duration of one year i.e. from April 2017 to May 2018 in the department of Pharmacology at Mallareddy Narayana multispecialty hospital, suraram, Telangana. A total 130 Patients who were suffering with acute, chronic hypertension and admitted in general medicine department and undergoing antihypertensive treatment were included.

Results: A Total of 130 patients with history of hypertension were included. majority of patients i.e., 46.1% (60/130) were among 51-60 years, followed by 24.6% (32/130) patients among 41-50 years., Male predominance 80/130 61.5%) compared to females 50/130 (38.4%). In the Present study, 105(80.7%) prescriptions had Monotherapy prescription and 25/130 (19.2%) has combination of two. The most frequently prescribed drug as monotherapy was Calcium Channel Blockers (CCBs) about 52.3%, Beta blockers constitute about 14.2%, and diuretics about 19%, 9.5% Angiotension Receptor Blockers (ARBs) and alpha-Adrenergic Blocker (AABs), 4.7% ACE inhibitors.

Conclusions: Calcium channel blockers are the highest among the drugs that are used as monotherapy. In combination therapy, diuretic with angiotensin receptor blocker and calcium channel blocker with beta blocker are the frequently prescribed drugs.

Keywords: Antihypertensives, Calcium channel blockers

INTRODUCTION

Hypertension is the most common disorder affecting the heart and blood vessels. Approximately 7.6 million deaths (13-15% of the total) and 92 million disability-adjusted life years worldwide were attributable to high blood pressure in 2001.[1] Hypertension attributes to 10% of ischemic heart disease, 21% of peripheral vascular disease, 24% of Acute MI, and 29% of Strokes.[2] The overall burden of hypertension related disease is rapidly rising in the developing world as a consequence of the aging population and increasing urbanization.[3] Classifying stages of hypertension: Stage 1 hypertension: 140-159/90-99mm Hg. Stage 2 hypertension: at or greater than 160-179/100-109mm Hg.[4] Drug Utilization Evaluation (DUE) is study of ongoing, systematic, criteria-based evaluation of drug use ensures that medications used appropriately (at the individual patient level). If therapy is found to be inappropriate, significant interventions with patients will be necessary to optimize drug therapy. A DUE is evaluation of drug as well disease-specific and can be structured to assess the actual process of prescribing, dispensing or administering drugs e.g. (indications, dose,

drug interactions, etc.). DUE is the same as drug utilization review (DUR) synonym terms.[5] Until about 1950, there was no effective treatment, and the development of antihypertensive drugs has been a major therapeutic success story. Now, high blood pressure can be controlled through existing antihypertensive drug therapy by following some guidelines. The Joint National Committee (JNC-7) is considered the "gold standard" consensus guidelines for the management of hypertension. The other guidelines are 2007 American Hypertension Association (AHA) and the 2007 European Society of Hypertension/European Society of Cardiology.[6-8] Treatment of hypertension with monotherapy or combination therapy is updated time to time according to JNC I to VII guidelines.[9]

METHODS

Ethical permission was taken from concerned institute. Informed consent was taken from all the patients who were included in the study. A cross sectional observational study in the patients with hypertension for duration of one-year i.e. from April 2017 to May 2018 in the department of Pharmacology at Mallareddy Narayana Multispecialty Hospital, Suraram, Telangana. A drug utilization review on antihypertensive drugs was done to determine and evaluate the different classes of antihypertensive medications with respect to diagnosis.

A Total of 130 patients who were suffering with acute, chronic and uncontrolled hypertension were included. All patients who were admitted in General medicine department and undergoing antihypertensive treatment were included. All the patients were screened thoroughly including age, sex, occupation, past history of hypertension, information on drug therapy (drug name, dosage form, frequency, route of administration, duration of treatment). Treatment data obtained from the patient's case sheet on a daily basis.

Inclusion criteria

- Age group 30 years to more than 80 years.
- Both genders
- Patients diagnosed with acute, chronic and uncontrolled hypertension.
- Patients willing to take antihypertensive drugs.

Exclusion criteria

- Patients not suffering from hypertension
- Gestational hypertension.
- Patients refusing consent.

RESULTS

A Total of 130 patients with history of hypertension were included.

In the present study majority of patients i.e., 46.1% (60/130) were among 51-60 years, followed by 24.6%

(32/130) patients among 41-50 years, 15.3% (20/130) were 61-70 years.7.6% among 30-40 years, 3.8% were among 71-80 years, least were more than 81 years i.e., 2.3%. Present study showed male predominance 80/130 (61.5%) compared to females 50/130 (38.4%) (Table 1).

Table 1: Age distribution of hypertensive patients.

Age in years	No. of cases	%
30-40 years	10	7.6
41-50 years	32	24.6
51-60 years	60	46.1
61-70 years	20	15.3
71- 80 years	05	3.8
>81 years	03	2.3
Total	130	99.7

Table 2: Personal history.

Personal history	No. of cases	%
History of Alcohol present	45	34.6
History of Smoking present	35	26.9
Both alcohol and smoking	30	23.0
History of Alcohol and smoking not present	20	15.3
Total	130	99.8

In the present study 46.1% (60/130) patients had family history of hypertension, 53.8% (70/130) had no family history of hypertension. In this study Majority of patients 70/130 (53.8%) with hypertension were having weight of 51-60kg. In the Present study 90 (69.2%) were significantly higher systolic blood pressure ranging more than 160mm Hg. 50 (38.4%) were having higher diastolic blood pressure ranging more than 100mm Hg (Table 2).

Table 3: Distribution of different stages of hypertension.

Stage of hypertension	No. of cases	%
Prehypertension	10	7.6
Stage I	90	69.2
Stage II	30	23
Total	130	99.8

The patients were categorized depending on the stages of the hypertension- 10 /130 (7.6%) patients belonged to pre-hypertension stage, 90/130 patients (69.2%) belonged to stage 1 hypertension and 30/130 (23%) patients belonged to stage 2 hypertension (Table 3).

Table 4: Usage pattern of drugs in mono therapy.

Drug therapy	No. of cases	%
Monotherapy	**105**	**80.7**
Combination therapy	25	19.2
Total	130	99.9

In the present study, 105 (80.7%) prescriptions had Monotherapy prescription and 25/130 (19.2%) has combination of two drugs (Table 4).

Table 5: Antihypertensive drugs prescribed as monotherapy.

Drugs		Drugs	No. of drugs	%
Diuretics	20	Furosemide	10	19
		Torsemide	10	
ACE inhibitors	05	Ramipril	2	4.7
		Enalpril	3	
Angiotensin II receptor blockers	10	Telmisarten	5	9.5
		Losartan	5	
Calcium channel blocker	55	Amlodipine	55	52.3
β adrenergic blockers	15	Metoprolol	15	14.2
α- β adrenergic blockers	10	Carvidilol	10	9.5

The most frequently prescribed drug as monotherapy was Calcium Channel Blockers (CCBs) about 52.3%, Beta blockers constitute about 14.2 %, and diuretics about 19%, 9.5% Angiotension Receptor Blockers (ARBs) and alpha-Adrenergic Blocker (AABs), 4.7% ACE inhibitors (Table 5).

Table 6: Antihypertensive drugs prescribed as combination therapy.

Class	Drugs	%
ARB+DIURETIC	10	40
CCB+ β BLOCKER	9	36
ARB+CCB	7	28
ACEI+DIURETIC	6	24
CCB+DIURETIC	4	16

Authors also observed few combination drugs in the prescription. Drug combinations were categorized depending on their class. The most frequently prescribed drugs combinations were ARB+Diuretic (40%), CCB+betablocker (36%), ARB+CCB (28%), ACEI+Diuretic (24%) and CCB+Diuretic (16%) (Table 6).

DISCUSSION

Present study included a total of 130 cases involving antihypertensive drug therapy were included. In Georgy M. Varghese et al study, 118 cases were included. Amit Sharma et al, study 150 patients were studied, Sharminder Kaur.[10-12] A total of 297 prescriptions were studied. Rajeev Mishra et al, study128 prescriptions were evaluated.[13]

In the present study majority of patients i.e., 46.1% (60/130) were among 51-60 years, followed by 24.6% (32/130) patients among 41-50 years., In Georgy M. Varghese et al, study most of the patients were between the ages of 51-70 years old, accounting for 75.21% of total cases, in Amit Sharma et al.[10,11] The mean age (mean±SD) of the patients was 59.28±11.0894 years with range 21-85 years and the median age was 60 years. Test of proportion showed most of the patients 58 (38.7%) were significantly higher in the age group 51-60 years., Sharminder Kaur et al, study.[12] The patients were in the age group of 20 to 90 years with mean age being 56.21, Supratim Dattastudy.[14] The mean age of males was (56.5) 15.9 as compared to (53.03) 19.3 in females. A total of 68.5% of the patients were in the 18-64 years age range whereas 31.5% were 65 years and as mentioned.

In the Present study, showed male predominance 80/130 (61.5%) compared to females 50/130 (38.4%). In Amit Sharma et al, study ratio of the patient's male: female was found to be 1.2:1.[11] Out of the 150 studied patients, 55.3% (83) of patients were male and 44.7% (67) of patients were female. In Sharminder Kaur et al, study male predominance (Male/Female ratio as 1:.85), Rajeev Mishra et al, study found that the prevalence of hypertension was more in male patients (66.1%) as compared to females (33.9%), Supratim Datta study Hypertension was observed to be more common in males (63.6%) than in females (36.4%).[12-14]

In the present study 46.1% (60/130) patients had family history of hypertension, 53.8% (70/130) had no family history of hypertension. Where as in Amit Sharma et al, study showed most of the patients were not having family history of hypertension, i.e., 147 (98.0%) while 3 patients (2.0%) were having family history of hypertension.[11]

In this study, majority of patients with hypertension were having weight of 51-60kg. Where as in Amit Sharma et al, study, it was found that the highest no. of hypertensive patient (55) were falling in the weight group of 51-60kg which were the 36.7% of total collected case.[11]

Usage pattern of individual drugs in mono therapy

In the Present study, 105 (80.7%) prescriptions had Monotherapy prescription and 25/130 (19.2%) has combination of two drugs .The most frequently prescribed drug as monotherapy was Calcium Channel Blockers (CCBs) about 52.3%, Beta blockers constitute about 14.2%, and diuretics about 19%, 9.5% Angiotension Receptor Blockers (ARBs) and alpha Adrenergic Blocker (AABs), 4.7% ACE inhibitors, In Georgy M. Varghese et al, study among individual drugs, amlodipine (43.22%), telmisartan (33.89%) and furosemide (27.11%) were the most utilized in all cases encountered.[10] Others were spironolactone 7.62%, metoprolol 7.62%, propranolol 6.77%, torsemide 6.77%, prazosin 5.93%, atenolol 5.93%, Enalapril 2.5%, nifedipine 1.69% and the least utilized drug was hydrochlorothiazide 0.85%.

In this study was coinciding with Juno J. Joel et al, study as the most frequently prescribed drug as monotherapy was Calcium Channel Blockers (CCBs) 48.2%, Angiotension Receptor Blockers (ARBs) 19.4%, Beta blockers (9.4%), ACE Inhibitors (8.8%), Diuretics (8.2%), Alpha Adrenergic Blocker (AABs) 2.9% and Centrally Acting Agents (CAAs) 2.9%.[1,15] Whereas Amit Sharma et al, study showed most of the patients 142 (94.7%) were on poly therapy significantly higher than mono therapy, double therapy and triple therapy 1 (0.7%), 0 (0%), 7 (4.7%), Rajeev Mishra et al, study it was observed that the monotherapy (81.7%) is more common than combination therapy (34.8%.).[13,11]

Authors also observed few combination drugs in the prescription. Drug combinations were categorized depending on their class. The most frequently prescribed drugs combinations were ARB+Diuretic (40%), CCB+betablocker (36%), ARB+CCB (28%), ACEI+Diuretic (24%) and CCB+Diuretic (16%).

In Georgy M Varghese et al, study Among 2 drug combinations combination of calcium channel blocker with angiotensin receptor blockers were utilized most, followed by calcium channel blockers + diuretics.[10] In 3 drug combinations, angiotensin receptor blocker + calcium channel blocker + diuretic was most utilized combination, in Jainaf Nachiya et al, study mono therapy was more frequently used than combination therapy (54.17% vs. 45.83%) Angiotensin II receptor antagonist 32 (1.5%), angiotensin converting enzyme inhibitor (ACE I) + angiotensin II receptorantagonist 22 (1.03%) and diuretics + calcium channel blockers + β-Blocker 17 (0.79%) proposed in this present study.[16]

Table 7: Drug prescribing pattern of hypertensive patient.

Class of drugs	Drugs	Amit Sharma et al study	Present study
Diuretics	Furosemide	75	10
	Torsemide	30	10
ACE inhibitors	Ramipril	29	2
	Enalpril	7	3
Angiotensin II receptor blockers	Telmisarten	12	5
	Losartan	7	5
	Olmisarten	1	-
Calcium channel blocker	Amlodipine	41	65
β adrenergic blockers	Metoprolol	22	20
α- β adrenergic blockers	Carvidilol	17	10

Georgy M. Varghese et al, study Calcium channel blockers (50.84%) were the most utilized in all cases, followed by diuretics 35.59%, angiotensin receptor blockers 27.95%, beta blockers 18.64%, alpha blockers 5.93%, and least utilized were angiotensin converting enzyme inhibitors 2.54% of all cases.[10]

Rajeev Mishra et al, study Calcium channel blockers (CCBs) (31.2%) were the most commonly prescribed antihypertensive agent as monotherapy, followed by angiotensin receptor blockers (ARBs) (22.3%) and angiotensin-converting enzyme inhibitors (ACEIs) (14.3%).[13] 9.8% patients were treated with combination of ARBs with CCBs, while 5.3% received combination of diuretics with ARBs.

CONCLUSION

Calcium channel blockers are the highest among the drugs that are used as monotherapy. In combination therapy, diuretic with angiotensin receptor blocker and calcium channel blocker with beta blocker are the frequently prescribed drugs. Amlodepin was commonly prescribed.

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