WORLD JOURNAL OF PHARMACEUTICAL RESEARCH
SJIF Impact Factor 8.084
Volume 10, Issue 7, 613-622. Research Article ISSN 2277– 7105

A PROSPECTIVE STUDY ON PRESCRIPTION PATTERN AND DRUG INTERACTION OF ANTIHYPERTENSIVE DRUGS ON TERTIARY CARE TEACHING HOSPITAL

Dr. Akash Subedi*, Dr. Bipul Subedi and Dr. Allam Pratyusha

Interaction of Antihypertensive Drugs on Tertiary Care Teaching Hospital Bangalore.

Article Received on
29 April 2021,

Revised on 19 May 2021,
Accepted on 09 June 2021

DOI: 10.20959/wjpr20217-20474

***Corresponding Author**
Akash Subedi
Interaction of Antihypertensive Drugs on Tertiary Care Teaching Hospital Bangalore.

ABSTRACT

Introduction: Irrationality while prescribing of drugs are mostly practised globally which leads in higher morbidity and mortality rate hence study of prescription pattern helps to overcome this problem. **Objective:** To study prescription pattern of antihypertensive drugs in hypertensive patients, to assess the drug interaction in prescription of hypertensive patients and to assess the rationality. **Methods and Methodology:** Prospective study was conducted in the tertiary care hospital for the period of 6 months. Rationality on 150 antihypertensive prescriptions were analysed using JNC 8 guidelines. Drug interactions (Major) were also accessed. **Results:** 150 HTN cases were examined among which 45.33% of patients had HTN with DM, 34.67% patients had HTN with other. 36.67% were treated with mono-therapy and 63.33% with combination therapy. Amlodipine, telmisartan, metoprolol are major drug having 25.46%, 14.55%, 20% using rate respectively. 82.67% of prescriptions were rational while 17.33% were irrational according to JNC VIII guidelines and 25.33% of prescriptions have interaction while 74.67% prescriptions were without drug interaction. **Conclusion:** A 17.33% deviation from guidelines was observed in the treatment and reported to the study department and suggestions were given. 25.33% prescription had DI.

KEYWORDS: Prevalence, treatment, Adherence, DI.

INTRODUCTION

Hypertension, defined as a persistent raised blood pressure of 140/90mmHg, although it rarely causes symptoms on its own, the damage it does to the arteries and organs can lead to considerable suffering and burdensome healthcare costs. Hypertension is the most common

risk factor for coronary heart disease (the leading cause of premature death in the world) and stroke.[1] It is also an important cause of congestive heart failure (heart strain) and chronic kidney disease. This disease is also sometimes known as the 'silent killer' because most of the people are not even aware that they are hypertensive. Hypertension is a disease of complex aetiology, affecting 972 million people worldwide. Prevalence of HTN in India is reported to vary from 4-15% in urban and 2-8% in rural population.[2] The principal goal of antihypertensive therapy is to prevent, arrest or reverse target organ damage (TOD) in patients with hypertension. This objective then requires achieving the goal or target blood pressure level - slowly but surely. Lifestyle modifications should be recommended for all patients with hypertension irrespective of antihypertensive drug therapy.[3]

The study of prescribing pattern provides useful information for the improvement of appropriate and effective use of drugs in hospital. This will produce significant impact on patients quality of life.[4] Earlier studies of prescription pattern in hypertensive patients reported the commonly prescribed drugs in monotherapy as well as incombination therapy.[5,6,7,8]

Therefore, prescription pattern studies, which analyze the therapy, are more meaningful and observe the prescribing attitude of physicians with the aim to provide drugs rationally.[8,9]

Keeping all these facts in consideration, the present study was designed to analyze the prescribing pattern and drug interactions of antihypertensive drugs in a tertiary care teaching hospital Bangalore. Hence the study was conducted with following objectives:

1. To study prescription pattern of antihypertensive drugs in hypertensive patients with or without complications.
2. To assess the drug interaction in prescription of hypertensive patients.
3. To assess the rational use of antihypertensive drugs.

METHODS AND METHEDOLOGY

- **Inclusion criteria**

All the inpatient in hospital who are treated for hypertension with other co morbidity.

- **Exclusion criteria**

Psychiatric patient

Children

Pregnant women

- **Duration of study**

The study will be conducted for a period of 6months.

- **Site of the study**

Study will be conducted at tertiary care hospital.

- **Study design**

A hospital based prospective observational study.

- **Size of study**

Study was conducted in 150 patients.

- **Study procedure**

A suitable designed data collection form was used to record all the necessary data including patient demographic details, patient medication history, and reason for admission, any allergic reaction, medication details and lab investigation.

Rationality was accessed by comparing with the JNC 8 guidelines and Drug related problem (DRPs) was identified and evaluated by referring Micromedex and standard text books and finding was discusses with the physicians to reduce DRPs.

RESULT

During the hospital stay of 150 cases we found that out of 95 (63.33%) male patients and 55 (36.67%) female patients.

Eight different class of antihypertensive drugs prescribed in 150 patients were assessed during study. During this period diuretics were mostly prescribed 69(23.71%) for hypertensive patients followed by β blockers 65(22.34%), calcium channel blockers 60 (20.62%), angiotensin receptor blockers 52 (17.87%), ACE inhibitors 23 (7.90%), but α blockers, α+β blockers and centrally acting drugs are prescribed very leastly which is shown in figure 1.

Figure 2 reveals, the two drug regimen were prescribed more 56 (37.33%) in hypertensive patients followed by mono therapy 55 (36.67%) and three drug regimen were 33 (22%) prescriptions, but ≥ 3 drug combination were very less i.e. 6 (4%) prescriptions.

Rationality was assessed by using JNC 8 guidelines out of 150 patients 124(82.67%) patients were prescribed antihypertensive drugs rationally and remaining 26(17.33%) patients were prescribed antihypertensive drugs irrationally according to JNC 8 guidelines which is shown in figure 3.

Total 25.33% of drug interaction was found in 150 prescription, among the Drug interactions assessed Furosemide+ Aspirin interactions were mostly seen and was found to be 28.95%, followed by Metoprolol + Aspirin 15.79%, Amlodipine+Clopidogrel 13.16%, Ramipril+Eplerenone 10.53%, Metoprolol + Glimepride 7.90%, Spironolactone+Aspirin, Ramipril+Aspirine 5.26%, Furosemide + Digoxin, Metoprolol+ Digoxin, Nebivolol + Metformin, Spironolactone + potassium Chloride and Atenolol + Amiodarone was found to be 2.63% which is shown in figure 4 and 5 respectively.

Table 1: Class of antihypertensive drugs prescribed for hypertensive patients.

S. no	Classes of drugs	No. of prescription	Percentage
1.	*Diuretics*	69	23.71%
2.	ACE Inhibitors	23	7.90%
3.	ARB	52	17.87%
4.	Alpha Blockers	11	3.78%
5.	α + β Blockers	07	2.41%
6.	Beta Blockers	65	22.34%
7.	*CCB*	60	20.62%
8.	Central Sympatholytics	04	1.37%
	Total drugs prescribed	291	100%

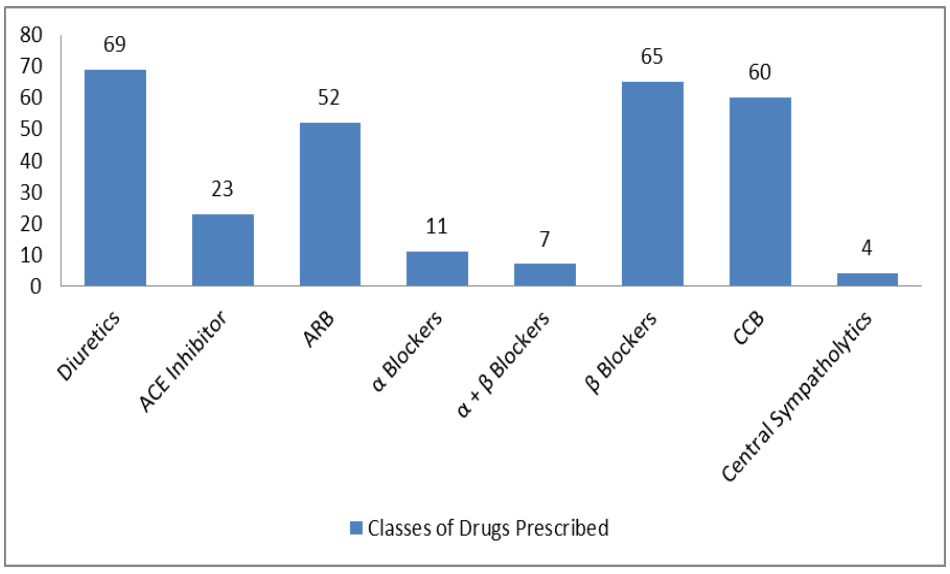

Fig. 1: Bar diagram of class of antihypertensive drugs prescribed.

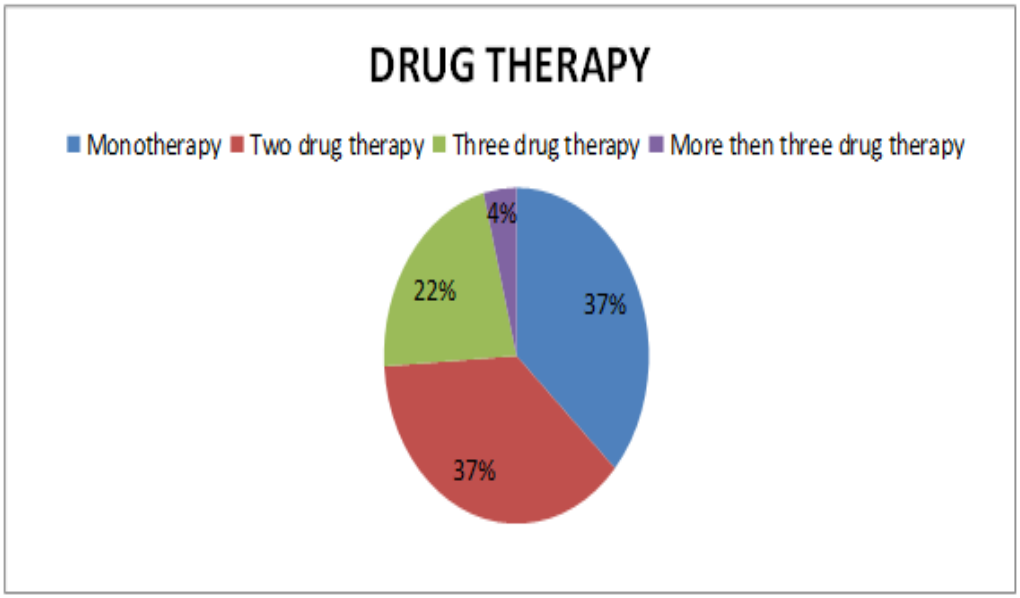

Fig. 2: Pie chart representing pattern of drug regimen prescribed.

Table 3: Prescription comparision with Jnc VIII.

Prescription status	No of prescription	Percentage
Rational prescription	124	82.67%
Irrational prescription	26	17.33%

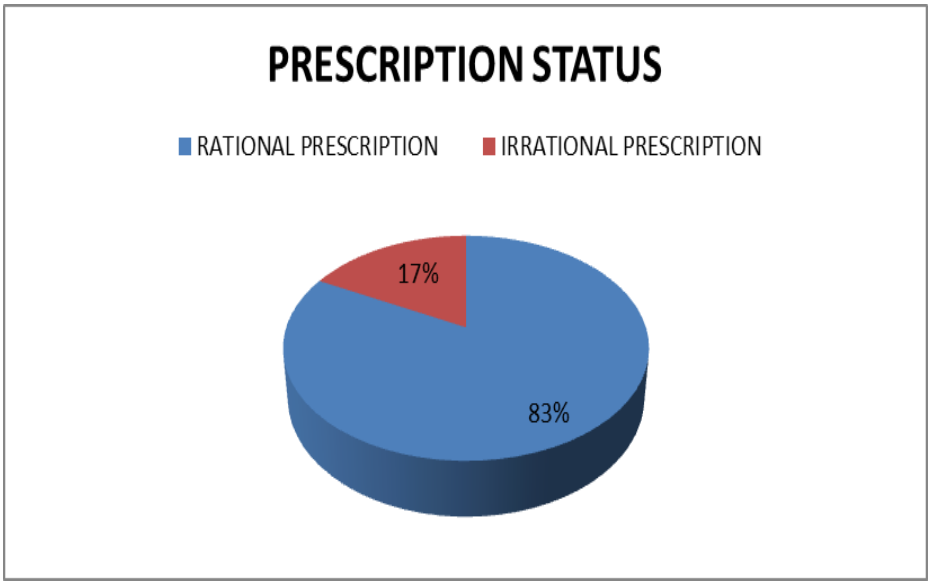

Fig. 3: Pie chart representing prescription comparision with jnc viii.

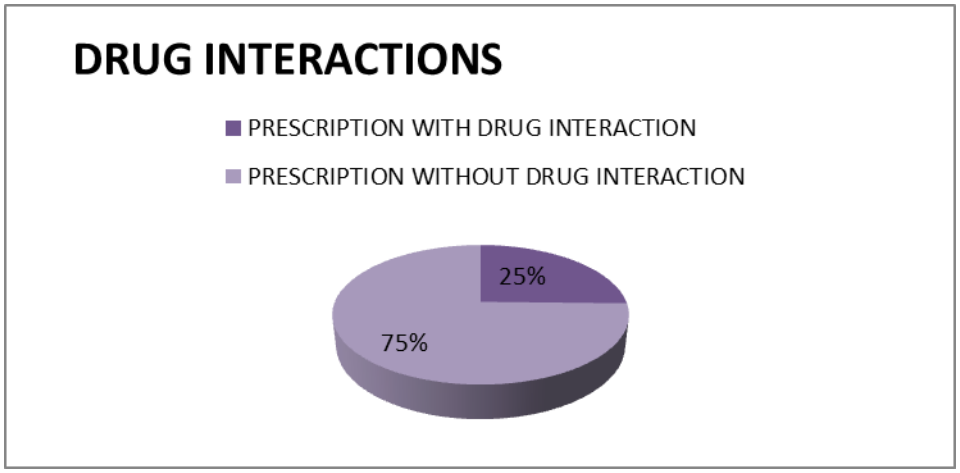

Fig. 4: Pie chart representing drug interaction.

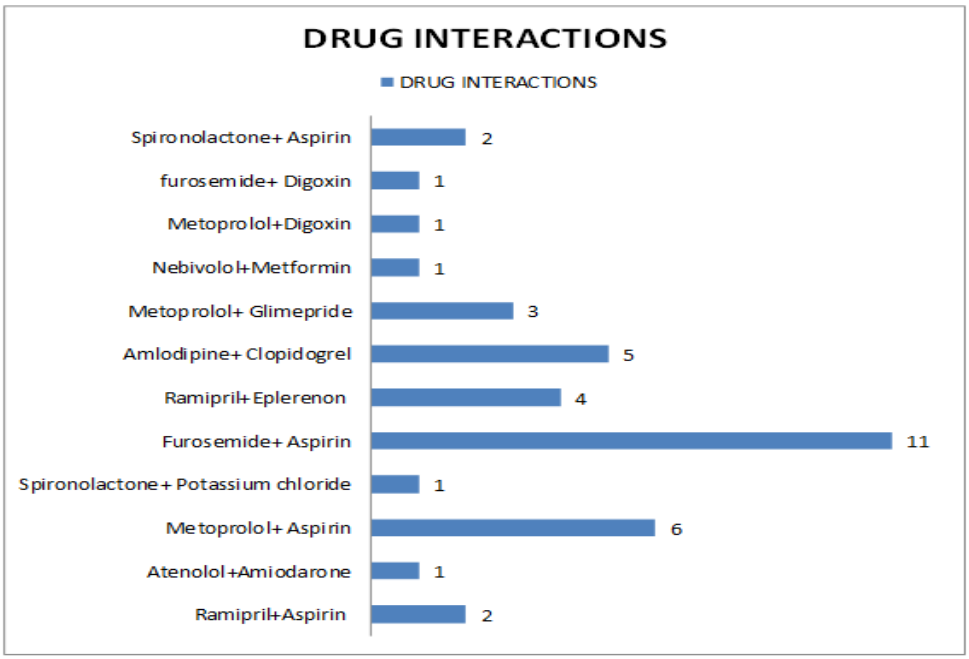

Fig. 5: Bar diagram representing drug interactions.

DISCUSSION

A prescription based study is considered to be one of the most effective methods to assess and evaluate the prescribing attitude of physicians and dispensing practice of pharmacists.[15]

The results of our study suggest that hypertension is more prevalent in Male patients (63.33%) than Female patients (36.67%).

Our finding, provide direct evidence of an increasing burden of hypertension especially among the elderly population. Prevalence of HTN increase with increasing age, 47 (31.33%)

patients had suffered from HTN within the age of 61-70 years and 39 (26%) patients had suffered from HTN within the age of 71-80 years.

Our study shows that 15.33% of patient had smoking habits, 10.67% have alcoholic behavior and remaining 74% patients were non alcoholic and non smoker, these alcoholic and smoking behavior can be determined as well established risk factor of HTN.

Our study also show that disease condition i.e. co-morbidity affect the prevalence of HTN, 45.33% of patients were suffered from HTN with Diabetes Mellitus followed by 34.67% of patients are having HTN with other complications, while 12.70% are suffering from HTN with CKD, 5.30% of patients are having HTN with CAD and 2% of patients are having HTN with Stroke.

In our analysis of treatment of HTN, we recognized that most hypertensive patient required multiple/combination hypertensive drug to control BP, 63.33% of cases were treated with combination therapy which was slightly lower than recommendations[16] and observations of several other studies demonstrated that the combination therapy was necessary in at least 70% the study population prescriptions to attain optimal blood pressure control.[17,18] and 36.67% were treated by monotherapy. In monotherapy Amlodipine, Metoprolol and Telmisartan are major used drugs.

In our study we observed the major route of drug administration was oral route (92.44%), followed by intravenous route (7.56%).

Out of 150 prescriptions, 25.33% of prescriptions had interactions among prescribed drugs while 74.67% prescriptions were without drug interactions. As we discussed above in our study combinations therapy is prescribed more than 50% thus there were more possibility to DDI's in the prescriptions and also various studies have shown that potential drug - drug interactions are frequent when patients receives multiple prescriptions.[19]

In our study rationality were assessed by comparing with the prescribing pattern of Joint National Committee -VIII. These guidelines are intended to provide practitioners with a standard approach to the rational, safe, and effective use of antihypertensive drugs for prevention of hypertension based on currently available clinical evidence and emerging issues.[20] Rational recommendations of antihypertensive were quite high for the hypertension patients in our study. Out of 150 patients 124(82.67%) were rationally recommended by our

physicians and remaining 26(17.33%) were irrationality recommended to hypertensive patients. Finally this assessment indicate in our hospital physicians are well adhered to JNC VIII guidelines which was a good sign to control hypertension for patients visiting our hospital.

CONCLUSION

In our study, 17.33% deviation from guidelines was observed in the treatment with respect to the Selection of antihypertensive drugs in various clinical conditions. No errors were observed with respect to route of administration. Around 25.33% prescription had DI and reported to the study department.

Our result shows that the choice of anti hypertensive drugs reasonably comply with the JNC VIII guidelines on the management of hypertension that confirms a fairly good degree of compliance by clinicians with JNC VIII guidelines for the treatment of hypertension. This study concludes the wide use of Diuretics, ARBs, ACEI, CCB and β Blockers for hypertension. However there is a need for improve patient education on adherence to therapy and greater attention by clinicians to issues of life style modifications, so as to improve BP control rate in this hospital.

REFERENCES

1. Ramanarayana VR , Padmalatha V, Satyanarayana V, Nagarjuna GR, Manohor Babu CH, Jayarami Reddy A. Impact of community pharmacy based patient education on quality of life in hypertension. Int J Pha, 2012; 2(1): 1-5.
2. Kearney PM, Whelton M, Reynolds K, Muntner P, Whelton PK, He J. Global burden hypertension: analysis of worldwide data. Lancet, 2005; 365: 217–223.
3. Texas Heart Institute Journal and Recommendation published on 2015 June 1st, (www.ncbi.nlm.nih.gov/pmc/articles/PMC4473614/).
4. Kanakambal S, Murgesh N, Shanth M. Drug prescribing pattern in tertiary care hospital in Madurai. Ind J Pharmacol, 2001; 33: 223.
5. Bajaj JK, Sood M, Singh SJ, Jerath P. Prescription patterns of antihypertensive drugs and adherence to jnc vii guidelines in a tertiary care hospital in north india. Int J Med Clin Res, 2012; 3(2): 118–20.
6. Busari OA, Oluyonbo R, Fasae AJ, Gabriel OE, Ayodele LM, Agboola SM, et al. Prescribing pattern and utilization of antihypertensive drugs and blood pressure control in

adult patients with systemic hypertension in a rural tertiary hospital in Nigeria. Am J Intern Med, 2014; 2(6): 144–9.

7. Tandon VR, Sharma S, Mahajan S, Mahajan A, Khajuria V, Mahajan V. Antihypertensive drug prescription patterns , rationality, and adherence to Joint National Committee 7 hypertension treatment guidelines among Indian postmenopausal women. J Midlife Heal, 2014; 5(2): 78–83.
8. Murti K, Khan MA, Dey A, Sethi MK, Das P, Pandey K. Prescription Pattern of Anti-Hypertensive Drugs in Adherence to JNC- 7 Guidelines. Am J Pharmacol Toxicol, 2015; 1(10): 27–31.
9. Rani MJ, Jyothsna G, Singh R. Evaluation of Prescription Pattern of Anti-hypertensive Drugs in Urban Population of Hyderabad. MRIMS J Heal Sci, 2014; 2(2): 89–91.
10. James P. A., Oparil S., Carter B. L., Cushman W. C., Dennison-Himmelfarb C., Handler J. 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) [published erratum appears in JAMA, 2014; 311(17): 1809] JAMA, 2014; 311(5): 507–20.
11. Chobanian AV, BakrisGL, Black HR et al The eighth report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure: the JNC 8 report. JAMA, 2003; 289: 2560–2572.
12. Mann J Fetal. Choice ofdrug therapy in primary (essential). In: Up To Date [Internet]. Philadelphia: Wolters Kluwer Health, 2015; 26. Available from: http://www.uptodate.com/contents/choice-of-drug-therapy-in-primary-essential-hypertension.
13. Lexi-Comp Online [AUHSOPIntranet].Hudson, OH: WoltersKluwer Health/Lexi-Comp, Inc, 2015; 26.
14. Drugsforhypertension. The Medical Letter, 2015; 4, 12(141): 31-37.
15. Yuen YH, Chang S, Chong CK, Lee SC, Critchlev JA, Chan JC. Drug utilization in a hospital general medical outpatient clinic with particular reference to antihypertensive and antidiabetic drugs. J Clin Pharm Ther, 1998; 23: 287-294.
16. WHO – International society of hypertension guidelines for the management of hypertension. J Hypertension, 1999; 17: 151-183
17. Chobanian AV, Bakris HR, Ceshman WC, Green LAJ220 JL, et al. The 7th report of the joint national committee on prevention, detection, evaluation and treatment of high blood pressure: the JNC7 report JAMA, 2003; 289: 2560-2572.

18. Chalmer J. The ABCD of antihypertensive therapy .J Hypertension, 2002; 20: 615-616.
19. Bista D, Palaian S, Shankar P. Understanding the essentials of drug interactions: A potential need for safe and effective use of drugs. Kathmandu Univ Med J, 2006; 4: 421-30.
20. Bipin B Panda, Manas R Pati, Pratap K Sahu et al. Survey of prescription pattern of antihypertensive drugs in Hypertensive and Diabetic Hypertensive patients. Asian Journal of Pharmaceutical and Clinical Research, 2015; 8: 1.