

A PROSPECTIVE STUDY ON PRESCRIPTION PATTERN OF ANTI HYPERTENSIVE DRUGS AND DRUG INTERACTIONS IN TERTIARY CARE TEACHING HOSPITAL

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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 in combination 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. | $\alpha + \beta$ 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% |

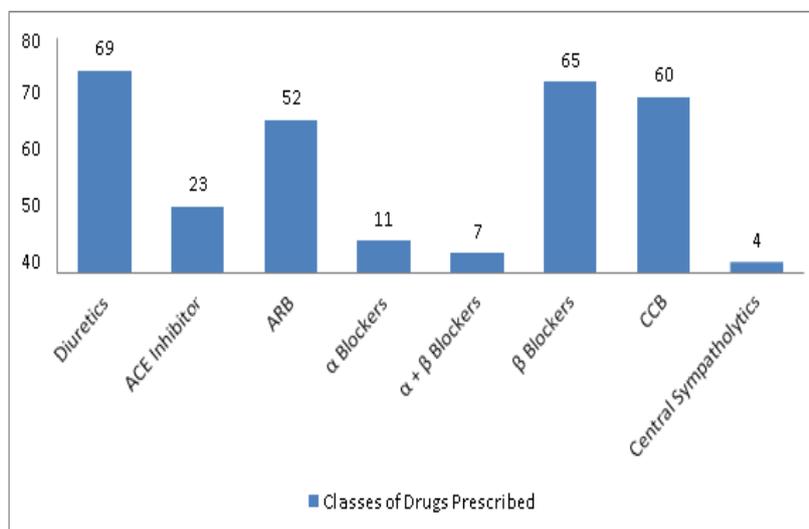


Fig. 1: Bar diagram of class of antihypertensive drugs prescribed.

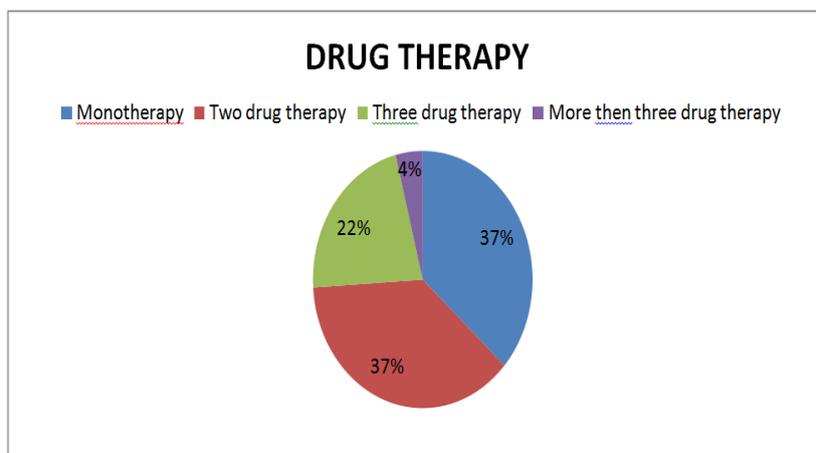


Fig 2: Pie chart representing pattern of drug regimen prescribed.

Table 3: Prescription Comparison With Jnc Viii.

| Prescription Status | No of prescription | Percentage |
|-------------------------|--------------------|------------|
| Rational Prescription | 124 | 82.67% |
| Irrational Prescription | 26 | 17.33% |

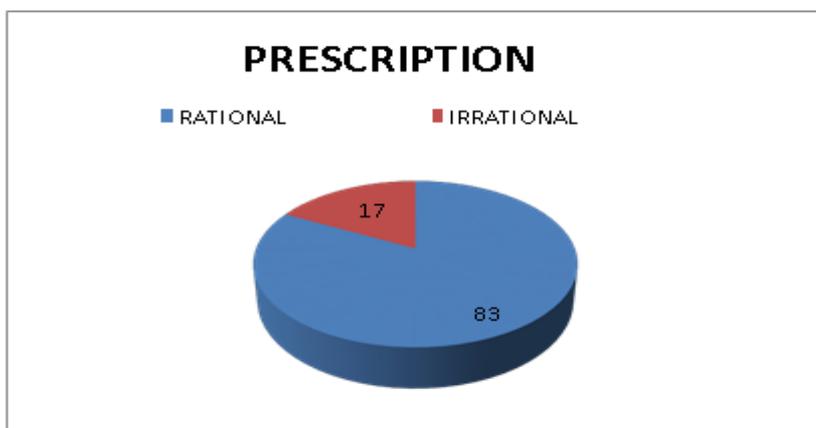


Fig 3: Pie chart representing prescription comparison with jnc viii.

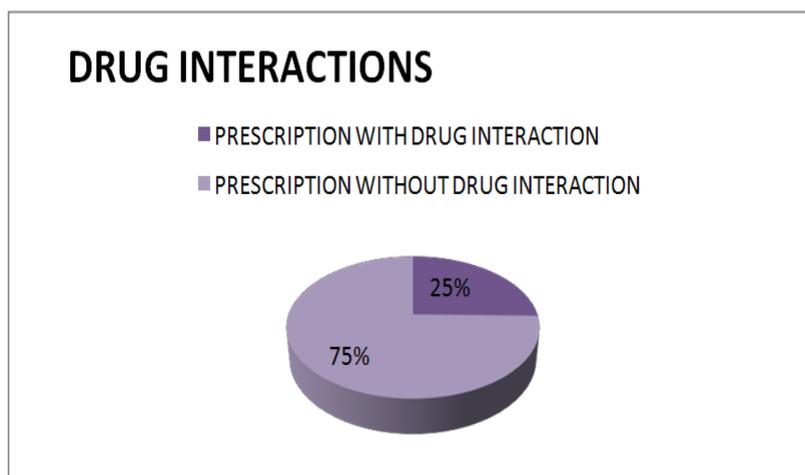


Fig 4: Pie Chart Representing Drug Interaction.

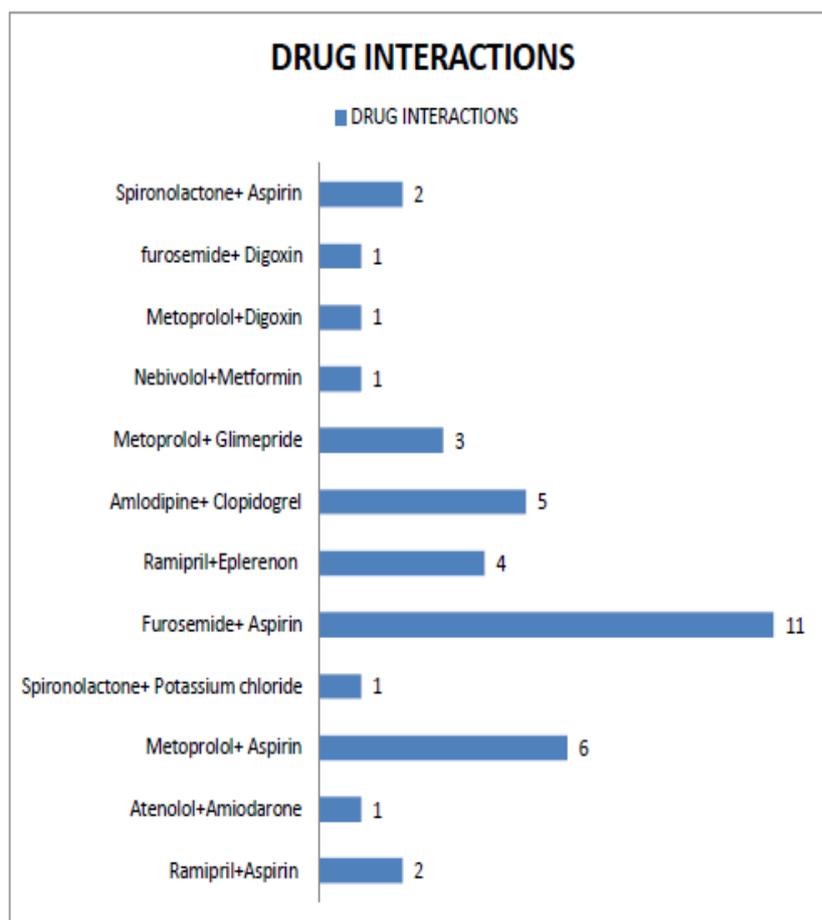


Fig 5: Bar Diagram Representing Drug Interactions.

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, Metopr olol 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.

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