



PRESCRIPTION PATTERN ANALYSIS OF ANTIHYPERTENSIVES IN A TERTIARY CARE HOSPITAL


Dasaradhi Ch^{*}, Revathi K, Kiranmai Y, Prasanthi B, Tejaswini N

Pharm D, Hindu College of Pharmacy, Guntur-522002, Andhra Pradesh, India.

ABSTRACT

Hypertension is a common disease that is simply defined as persistently elevated arterial blood pressure (BP). Although elevated BP was perceived to be “essential” for adequate perfusion of essential organs during the early and middle 1900s, now it is identified as a major global health problem for cardiovascular diseases like Stroke, Arrhythmias, Renal failure, CHF, etc. The World Health Organization also considers elevated blood pressure (BP) as the most important risk factor for cardiovascular outcomes and carries a high health burden in terms of morbidity and mortality worldwide. Numerous clinical trials have shown that lowering blood pressure (BP) reduces CV risk by 20% - 25% for myocardial infarction, 35%-40% for stroke and by 50% for heart failure. There is a strong positive relationship between blood pressure level and cardiovascular disease risks among general population. Despite of this association, some patients with hypertension do not experience CV events during long life spans and CV events are observed to occur in normotensive individuals also. Reduction of systolic BP of just 2 mmHg can reduce the risk of CVD by 7–10%. In the present study it was observed that most of the patients were prescribed with dual therapy when compared to mono, triple and quadruple therapy. Beta blockers were most prescribed class of anti-hypertensives for hypertensive patients in monotherapy. In dual therapy beta blockers and ARB's was the most prescribed combination.

Key words: Beta Blockers, Cardiovascular Risk, ARB's, Prescription Pattern.

Access this article online		
Home page: http://www.mcmed.us/journal/ijacr	Quick Response code	
DOI: http://dx.doi.org/10.21276/ijacr.2019.6.2.3		
Received:25.06.19	Revised:12.07.19	Accepted:15.07.19

INTRODUCTION

Hypertension is a common disease that is simply defined as persistently elevated arterial blood pressure (BP). Although elevated BP was perceived to be “essential” for adequate perfusion of essential organs during the early and middle 1900s, now it is identified as a major global health problem for cardiovascular diseases like Stroke, Arrhythmias, Renal failure, CHF, etc.[1]

Corresponding Author

Dr. Dasaradhi Ch

Email : dasaradhi11@gmail.com

The World Health Organization also considers elevated blood pressure (BP) as the most important risk factor for cardiovascular outcomes and carries a high health burden in terms of morbidity and mortality worldwide.[2]

A clinical diagnosis of hypertension is confirmed when blood pressure taken on two or more occasions is higher than normal value. Starting at 115/75 mmHg, cardiovascular risk doubles with each increment of 20/10 mmHg throughout the blood pressure (BP) range, according to the Indian guidelines-III, 2013.[3]

CLASSIFICATION OF HYPERTENSION

Based on the JNC VIII guidelines Hypertension is classified as following;

Classification Of HTN	Systolic BP (mmHg)	Diastolic BP (mmHg)
Normal Hypertension	< 120	< 80
Pre Hypertension	120 – 139	80 - 89
Stage 1 Hypertension	140 - 159	90 - 99
Stage 2 Hypertension	> 160	> 100

According to JNC 8 Hypertension guidelines the goal B.P in general population (no Diabetes or CKD) of age ≥ 60 yrs is <150/90 mmHg; age <60 yrs is <140/90 mmHg. The goal B.P in patients of all ages with DM or CKD or both is <140/90 mmHg.[4]

It has been well established that pharmacological treatment for hypertension substantially reduces the risk of stroke, coronary heart disease, and other cardiovascular diseases. Traditionally the ultimate goal of antihypertensive therapy is the prevention of atherosclerotic cardiovascular (CV) and renal complications and there is no doubt that antihypertensive therapy reduces CV risk. [5]

Numerous clinical trials have shown that lowering blood pressure (BP) reduces CV risk by 20% - 25% for myocardial infarction, 35%-40% for stroke and by 50% for heart failure. There is a strong positive relationship between blood pressure level and cardiovascular disease risks among general population. Despite of this association, some patients with hypertension do not experience CV events during long life spans and CV events are observed to occur in normotensive individuals also. Reduction of systolic BP of just 2 mmHg can reduce the risk of CVD by 7–10%. [5]

FACTORS THAT CANNOT BE CHANGED:

- **Age:** The older a person is, the greater the likelihood that he or she will develop high pressure, especially elevated systolic readings. This is largely due to arteriosclerosis, or “hardening of the arteries [6].
- **Race:** Indians, Africans, Americans develop high blood pressure more often than Caucasians. They develop high blood pressure at a younger age and develop more severe complications sooner in life [7].
- **Socioeconomic status:** High blood pressure is found more commonly among the less educated and lower socioeconomic groups. Residence of south Asians countries like India, southeastern united states, both Caucasians and Africans, are more likely to have high blood pressure than residents of other regions [8].
- **Family history (heredity):** The tendency to have high blood pressure appears to run in families [8].
- **Gender:** Generally, men have a greater likelihood of developing high blood pressure than women. This likelihood varies according to age and among various ethnic groups [8].

NON PHARMACOLOGICAL THERAPY:

- Life style measures should be instituted in all patients including those who require immediate drug treatment. These include:

Lifestyle Modifications [9]		
Modification	Recommendation	Approximate Systolic Blood Pressure Reduction (mm Hg) ^a
Weight loss	Maintain normal body weight (body mass index 18.5-24.9 kg/m ²)	5-20 per 10-kg weight loss
DASH-type dietary patterns	Consume a diet rich in fruits, vegetables, and low-fat dairy products with a reduced content of saturated and total fat	8-14
Reduced salt intake	Reduce daily dietary sodium intake as much as possible, ideally to 65 mmol/day (1.5 g/day sodium, or 3.8 g/day sodium chloride)	2-8
Physical activity	Regular aerobic physical activity (at least 30 min/day, most days of the week)	4-9
Moderation of alcohol intake	Limit consumption to 2 drinks/day in men and 1 drink day in women and lighter-weight person	2-4
DASH, Dietary Approaches to Stop Hypertension.		

- “Effects of implementing these modifications are time and dose dependent and could be greater for some patients.

PRESCRIPTION PATTERN MONITORING:

Prescription pattern monitoring studies (PPMS) are drug utilization studies with the main focus on prescribing, dispensing and administering of drugs. They promote appropriate use of monitored drugs and reduction of abuse or misuse of monitored drugs. PPMS also guide and support prescribers, dispensers and the general public on appropriate use of drugs, collaborate and develop working relationship with other key organizations to achieve a rational use of drugs[10]. Prescription patterns explain the extent and profile of drug use, trends, quality of drugs, and complaints with regional, state or national guidelines like standard treatment guidelines, usage of drugs for essential medicine list and use of generic drugs.

There is increasing importance of PPMS because of a boost in marketing of new drugs, variations in pattern of prescribing and consumption of drugs, growing concern about delayed adverse effects, cost of drugs and volume of prescription [11]. The aim of PPMS is to facilitate rational use of drugs in a population. Irrational use of medicines is a major problem worldwide. WHO estimates that more than half of all medicines are prescribed, dispensed or sold inappropriately, and that half of all patients failed to take them correctly [10]. The overuse, underuse or misuse of all medicines results in wastage of scarce resources and widespread health hazards. The rational use of medicines (RUM) is defined as “patients receive medications appropriate to their clinical needs, in doses that meet their own individual requirements, for an adequate period of time, and at the lowest cost to them and their community[11].

AIMS AND OBJECTIVES:

- To study the effectiveness of therapeutic approach in patients with cardiovascular problems.
- To evaluate the appropriate therapeutic approach for cardiovascular problems.
- To estimate the pattern of antihypertensive prescription by cardiologists in the study hospital.

METHODOLOGY:

The study was performed on outpatients of cardiology department of Sri Krishna Institute of Medical Sciences, located beside Manipuram flyover, near RTC Bus stand, Thamma ranga reddy nagar, Guntur, Andhra Pradesh-522001. This is a prospective and observational study which involves collection of echo reports and blood pressure and does not involve any invasive techniques like collection of blood samples. The study was carried out for a period of six months i.e; from November 6, 2017 to April 6, 2017 at Sri Krishna Institute of medical sciences, Guntur.

Inclusion criteria:

- Patients diagnosed with hypertension of age above 18 yrs.
- Patients with heart diseases or disorders who use antihypertensives.
- Patients with or without any co-morbid conditions.
- Patients of outpatient ward of cardiology department who fit to our study.
- Patients of either gender.
- Patients who comply to participate in the study with a written informed consent.

Exclusion criteria:

- Patients not willing to participate in the study.
- Patients admitted to wards other than cardiology.
- Patients who do not receive any antihypertensives.
- Patients below 18 yrs of age.
- Pregnant and lactating women.

RESULTS AND DISCUSSION:

During the whole study period, a total of 528 prescriptions for four visits (6 months) of 132 hypertensive patients were collected and the number and percentage of prescriptions, with either mono therapy or combination therapy i.e., two or more drug regimens, is shown in Table 1.

Table 1. Types of therapy and their prescriptions

Types of therapy	Total number of prescriptions(528)	Percentage
Monotherapy	189	35.79
Dual therapy	228	43.18
Triple therapy	90	17.04
Quadruple therapy	15	2.84
Penta therapy	6	1.13

Figure 1. Types of therapy and their prescriptions

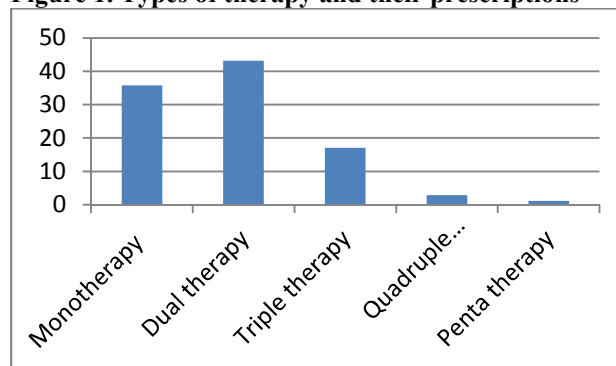


Table 2. Frequency of prescribing single antihypertensive drug

We observed that six different single antihypertensive drugs were prescribed to hypertensive patients (Table 5.9).Beta blockers were most commonly prescribed(61.90%), followed by ARB’s and CCB’s being prescribed at the same level (i.e., 12.69%) .The fourth most drug being prescribed in monotherapy was diuretics (6.34%). The prescription of other two single drugs individually accounted for <4%. This frequency of prescribing monotherapy was depicted in the figure 2.

Table 2. Frequency of prescribing single antihypertensive drug

Class of drug	Total number of prescriptions(189)	Percentage (%)
Beta blockers	117	61.9
ARB’s	24	12.69
CCB’s	24	12.69
Diuretics	12	6.34
ACE inhibitors	6	3.17
□+β blockers	6	3.17

Figure 2. Frequency of prescribing single antihypertensive drug

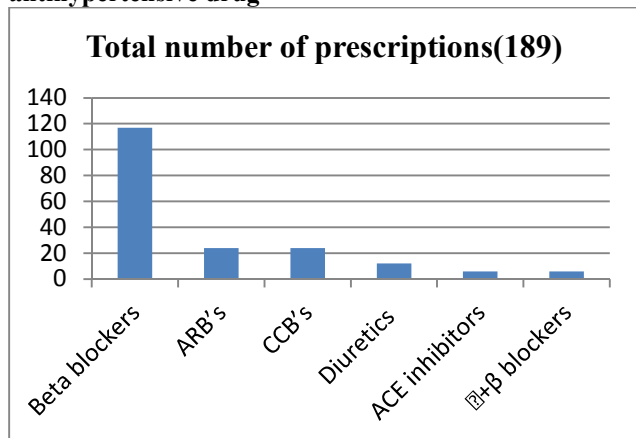


Table 3. Frequency of Prescribing Dual Antihypertensive Drug Combination

We observed that ten different dual antihypertensive drug combinations were prescribed to hypertensive patients. B blocker + ARB's was most often prescribed 19.73%, and Utilization of combinations B blocker + CCB's, ARB's + diuretic were almost similar 17.10% and occupies the second place, followed by Two diuretics prescribed to 15.78 %, ARB's + CCB to 13.15%, B blocker + alpha blocker to 5.26%, and both B blocker + diuretics, ACEs + diuretic to 3.94% and rest accounting less than 2%. This is also shown in the figure 3.

Table 4. Frequency of prescribing two antihypertensive drug combination

Dual combination therapy	Total number of prescriptions(228)	Percentage (%)
B blocker + ARB's	45	19.73
B blocker + CCB's	39	17.1
ARB's + diuretic	39	17.1
Two diuretics	36	15.78
ARB's + CCB	30	13.15
β blocker + α blocker	12	5.26
β blocker + diuretics	9	3.94
ACEs + diuretic	9	3.94
ARB's + (α + β) blocker	6	2.63
CCB's + α blocker	3	1.31

Figure 3. Frequency of Prescribing Dual Antihypertensive Drug Combination

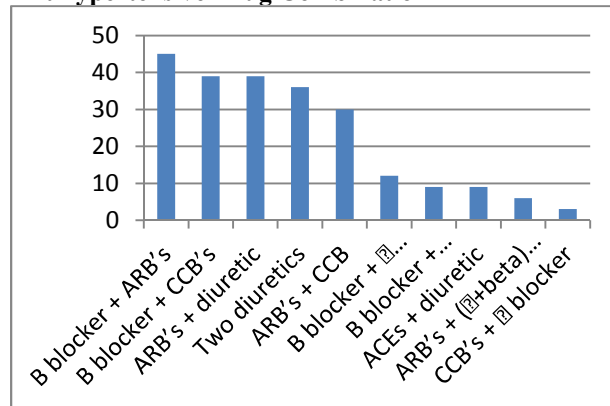


Table 5. Frequency of Prescribing Triple Drug Combination Therapy of Antihypertensives

We observed that eight different triple antihypertensive drug combinations were prescribed to hypertensive patients. The first most commonly prescribed combinations are Beta + 2 diuretics 18.91%, followed by ARB's + beta + CCB 16.21%, and Beta +CCB's+ diuretic , ARB's+ beta + diuretic, CCB+ARB+ diuretic frequency of prescribing was similar i.e., 10.81 % and the rest account less than 5%. And this is also represented in figure 4.

About three different quadruple drug therapy and one penta therapy was prescribed and they accounted for below 6% of the total prescriptions and represented in figure 5.

Table 5. Frequency of Prescribing Triple Drug Combination Therapy of Antihypertensives

combination therapy	Total number of prescriptions (111)	Percentage (%)
Triple therapy		
Beta + 2 diuretics	21	18.91
ARB's + beta + CCB	18	16.21
ARB's+ beta + diuretic	12	10.81
CCB+ARB+ diuretic	12	10.81
Beta +CCB's+ diuretic	12	10.81
ARB's + 2 CCB's	6	5.4
ACE+CCB+diuretic	6	5.4
ARB+ 2 diuretics	3	2.7
Quadruple therapy		
ARB+beta blockers +2 Diuretics	6	5.40
2 ARBs+2 Beta	6	5.40

blockers		
ARB+ CCBs+ 2 Diuretics	3	2.70
Penta therapy		
ARB's +CCB+2 diuretics (alpha+beta) blocker	6	5.40

Figure 4. Frequency of Prescribing Triple Drug Combination Therapy of Antihypertensives

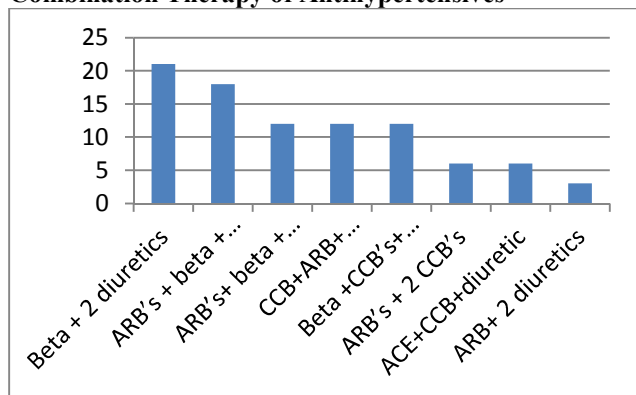
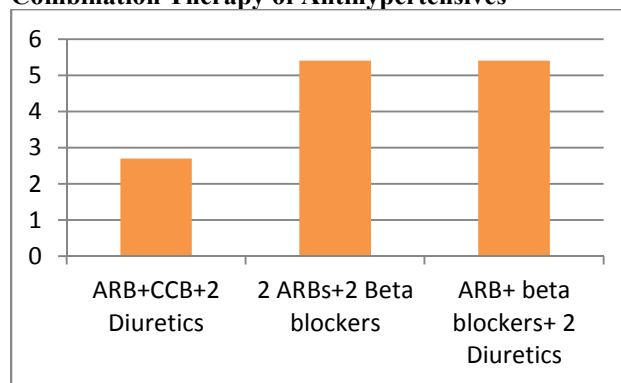


Figure 5. Frequency of Prescribing Triple Drug Combination Therapy of Antihypertensives



CONCLUSION:

In the present study it was observed that most of the patients were prescribed with dual therapy when compared to mono, triple and quadruple therapy. Beta blockers were most prescribed class of antihypertensives for hypertensive patients in monotherapy. In dual therapy beta blockers and ARB's was the most prescribed combination.

REFERENCES

1. Dipiro, Joseph T. (2014) editor; Section 1:Cardiovascular disorders – Hypertension, Pharmacotherapy: A Pathophysiologic Approach, 9th edition, New York: McGraw-Hill Medical, 200.
2. Indian guidelines on hypertension (I.G.H.) – III. (2013). *J Assoc Physicians India*, 61(2 Suppl), 6-36.
3. EduardoHernandez-Vila. (2007) A Review of JNC 8 Blood Pressure Guidelines : *Text Heart Inst J V.* 42(3), 226-228 .
4. Antonakoudis G, Poulimenos I, Kifnidis K, Zouras C, Antonakoudis H. Blood pressure control and cardiovascular risk reduction. *Hippokratia.*, 11(3), 114-119.
5. <http://www.cadiresearch.org/topic/hypertension/hypertension-india>.
6. Poulter NR, Prabhakaran D, Caulfield M (2015). Hypertension. *Lancet* (London, England). 386 (9995): 801-12. doi:10.1016/S0140-6736(14)61468-9. PMID 25832858.
7. Vasani RS, Beiser A, Seshadri S, et al. (2002) Residual Lifetime Risk for Developing Hypertension in Middle-aged Women and Men: The Framingham Heart Study. *JAMA.* 287(8), 1003–1010. doi:10.1001/jama.287.8.1003. PMID 11866648.
8. Marshall Iain J, Wolfe Charles DA, McKeivitt Christopher.(2012) Lay perspectives on hypertension and drug adherence: systematic review of qualitative research. *BMJ*, 345, e3953. PMC 3392078. PMID 22777025.
9. Anker M, Brudon-Jacobowicz P, Fresle DA VHogeereil H. How to investigate drug use in health facilities: selected drug use indicators. 1993; Geneva, Switzerland: WHO; 1995.
10. Biswas NR, Biswas RS, Pal PS, et al. (2000) Patterns of prescription and drug use in two tertiary hospitals in Delhi. *Indian J Physiol Pharmacol*, 2000;44, 2000, 109-12.
11. Mathur Mukul, Dandiya PC. (2004) Prescribing pattern for outpatients in government hospitals in Jaipur. *Indian J Pharmacol.* 36(6), 383-4.

Cite this article:

Dasaradhi Ch, Revathi K, Kiranmai Y, Prasanthi B, Tejaswini N. Prescription Pattern Analysis Of Antihypertensives In A Tertiary Care Hospital. *International Journal Of Advances In Case Reports*, 6(2), 2019, 35-40.

DOI: <http://dx.doi.org/10.21276/ijacr.2019.6.2.3>



Attribution-NonCommercial-NoDerivatives 4.0 International