



DRUG UTILIZATION PATTERN OF ANTIHYPERTENSIVE DRUGS AT TERTIARY CARE TEACHING HOSPITAL

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ABSTRACT **Introduction:** Hypertension continues to be an important public health concern because of its associated morbidity, mortality and economic impact on the society. It is a significant risk factor for cardiovascular, cerebrovascular and renal complications. It has been estimated that by 2025, 1.56 billion individuals will have hypertension.

Materials and Methods: Present study was a prospective cross sectional observational study carried out in the outpatient of Department of General Medicine of JNU Medical College and Hospital, a tertiary care teaching hospital, in Jagathpura, Jaipur. Prescriptions of 90 diagnosed hypertensive patients were analysed. Data was recorded as mean±standard deviation.

RESULTS: The mean age of the patients was 56.23±9.63 years with range 18-80 years. 74 (82.2 %) of patients were male and 16 (17.8%) of patients were female. Mean duration of hypertension was 3.97±2.55. Most of the patients 43 (47.8%) were on Mono therapy significantly higher than dual therapy, triple therapy and poly therapy, 29 (32.5%), 11 (12.2%), 7 (7.8%) respectively. Calcium channel blocker was the frequently used class of drug for monotherapy (20%). Polytherapy was seen in 7.8% patient. Among 90 patients' only 23 patients were reported ADR. Maximum no of ADRs were reported from patients receiving ACE inhibitor

Conclusions: In this study usage of anti hypertensive drugs were prescribed rationally in tertiary care hospital. The study emphasizes that need for effective continuing medical education and also preventive measures in hypertensive individuals.

KEYWORDS : Anti hypertensives, Angiotensin receptor blockers, Drug utilization study.

INTRODUCTION

Hypertension is the most common modifiable risk factor for cardiovascular diseases (CVD), stroke and renal failure.^[1] It is the second leading cause of chronic kidney disease (CKD). It is estimated that more than one billion adults are hypertensive worldwide and this figure is projected to increase to 1.56 billion by the year 2025, which is an increase of 60 % from 2000. Cardiovascular diseases and Hypertension are accounting for loss of 4 % gross domestic product for low and middle-income countries annually which is amounting 500 billion USD.^[2] Clinical evidence suggests that lowering blood pressure (BP) with antihypertensive drugs reduces the risk of myocardial infarction, stroke, heart failure, revascularization procedures and end-stage renal diseases in hypertensive patients.^[3]

The increasing prevalence of hypertension has been attributed to population growth, ageing and behavioral risk factors, such as unhealthy diet, excess use of alcohol, sedentary lifestyle, obesity, and exposure to persistent stress. A whopping 9.4 million deaths occur worldwide every year because of hypertension,^[4] with it being responsible for about 50 % of mortality due to heart disease and stroke. Epidemiological studies demonstrated that prevalence of hypertension is increasing rapidly in India, varying from 4 to 15 % in urban and 2-8 % in rural population.^[5,6]

Hypertension pharmacotherapy and guidelines: Antihypertensive drugs are prescribed mainly to reduce the morbidity and mortality caused by hypertension and its complications. Many a time, patients require more than one drug for effective control of hypertension. Various classes of antihypertensive drugs like diuretics, inhibitors of the renin-angiotensin system, calcium channel blockers (CCB) and beta blockers (BB) have been shown to reduce complications of hypertension and may be used for initial drug therapy.^[7] Since the need to improve the control of hypertension is well acknowledged, several guidelines on its classification and management have been developed. Some of the bodies which have developed guidelines are American Society of Hypertension/ International Society of hypertension (ASH/ISH), Joint National Committee (JNC) on Detection, Evaluation, and Treatment of High Blood Pressure, European Society of Hypertension (ESH)/European Society of Cardiology (ESC), National Institute for Health and Care Excellence (NICE) and Japanese Society of Hypertension. The JNC 8 guidelines published in

2014 are the most recent guidelines for the management of hypertension in different clinical settings. These guidelines were developed based on a systematic review of literature to help clinicians, especially the primary care physicians.^[8] Despite these guidelines, and also evidence showing that hypertension is a major public health concern, many clinicians fail to assess BP routinely, and in those with a diagnosis of hypertension, do not start treatment or titrate the dosage of the drugs effectively.^[9] The available guidelines recommend different goal BP levels and drug treatment options according to patients' individual clinical need.

MATERIALS AND METHODS:

A prospective, cross-sectional observational study was conducted in 90 subjects in outpatient of Department of General Medicine, JNU Medical College and Hospital, Jagathpura, Jaipur, from duration of 9 months (January-2020 to September 2020). Before initiation of study, the approval of institutional Ethics Committee was obtained.

INCLUSION CRITERIA

- Subjects who are newly diagnosed and established history of hypertension
- Subjects who are ≥20 years and above as well as both the genders
- Hypertensive patient's systolic blood pressure as ≥140mm Hg and diastolic blood pressure ≥90mm Hg at the time of diagnosis were included in the study.

EXCLUSION CRITERIA

- Subjects with significant hepatic and renal diseases
- Pregnant women
- Chronically ill patients and psychiatric illness.

Data collection and analysis

Data was collected over a period of Nine months from January 2020 to September 2020. A predesigned pretested schedule was employed to collect the data. The schedule contained information was pertaining to basic demographic variable like age, sex, medical history comorbid condition, and a format to assess the antihypertensive drugs prescribed.

Prescribed anti-hypertensive were classified into angiotensin receptor blockers, angiotensin converting enzyme inhibitors, calcium channel

blockers, beta blockers, loop diuretic. The data was collected, and WHO core drug prescribing indicators was analyzed.

RESULTS

In this study total 90 patients were included.

Table 1: Distribution of age group.

Age group in years	18-40	41-60	61-80
No. of patients	6	50	34
Percent	6.7	55.6	37.7

The mean age (mean±S.D) of the patients was 56.23±9.63 years with range 18-80 years and the median age was 58 years (Table 1). Test of proportion showed most of the patients were significantly higher in the age group 41-60 years.

Table 2: Gender distribution of patient.

Gender	Male	Female
No. of patients	74	16
Percent	82.2	17.8

The gender ratio of the patient's male: female was found to be 1.2:1. Out of the 90 studied patients, 82.2% (74) of patients were male and 17.8% (16) of patients were female. Test of proportion showed that the male patients were slightly more than the female patients (Table 2).

Table 3: Duration of hypertension.

Duration in years	< 3 years	4-6 years	> 7 years
No. of patients	55	28	7
Percent	61.1	31.1	7.8

In table 3, test of proportion showed 55(61.1%) patients were less than 3 years, followed by 28 (31.1%) patients were between 4-6 years and least were 7 (7.8%) were having history of >7 years (Table 3).

Table 4: Systolic blood pressure distribution in patients.

Systolic blood pressure (mmHg)	120-139 (Pre HTN)	140-159 (Stage 1 HTN)	160-179 (Stage 2 HTN)	>180 (HTN emergency)
No. of patients	8	32	39	11
Percent	8.9	35.6	43.3	12.2

The mean systolic blood pressure (mean±S.D) of the patients was 153.52±14.54 and the median was 152. Test of proportion showed most of the patients 39 (43.3%) were significantly higher systolic blood pressure ranging more than 160 mmHg (Table 4).

Table 5: Distribution of Diastolic blood pressure in patients

Diastolic blood pressure (mmHg)	80-89 (Pre HTN)	90-99 (Stage 1 HTN)	100-119 (Stage 2 HTN)	>120 (HTN emergency)
No. of patients	10	35	38	7
Percent	11.1	38.9	42.2	7.8

The mean diastolic blood pressure (mean±S.D) of the patients was 97.41±12.63. Test of proportion showed most of the patients 38 (42.2%) were significantly higher diastolic blood pressure ranging from 100-119 mmHg (Table 5).

Table 6: Distribution of drug therapy in patients.

Drug Therapy	Monotherapy	Dual therapy	Triple therapy	Poly therapy
No. of patients	43	29	11	7
Percent	47.8	32.2	12.2	7.8

Test of proportion showed most of the patients 43 (47.8%) were on Mono therapy significantly higher than dual therapy, triple therapy and poly therapy, 29 (32.2%), 11 (12.2%), 7 (7.8%) respectively (Table 6).

Table 7: Utilization pattern of different antihypertensive drugs.

Treatment	No. of patients use antihypertensive drug	Percent
Monotherapy		
Calcium channel blocker	18	20
ARB	8	8.9
ACE Inhibitor	5	5.6
Beta Blocker	7	7.8
Alpha Blocker	2	2.2
Diuretics	3	3.3

Dual therapy		
CCB+ARB	12	13.3
CCB+Beta Blocker	7	7.8
CCB+ Diuretic	2	2.2
ARB+ Diuretic	2	2.2
Others	6	6.7
Triple therapy		
CCB+ARB+Diuretic	5	5.6
CCB+B Blocker+Diuretic	4	4.4
Others	2	2.2
Polytherapy	7	7.8

Calcium channel blocker was the frequently used class of drug for monotherapy (20%). In dual drug therapies were CCB+ARB accounting for 13.3%, and 5.6% of patients were on triple drug therapy with CCB+ARB+Diuretic. Polytherapy was seen in 7.8% patients

Table 8: WHO causality assessment of ADRs.

Type of reaction	No. of patients reported ADR (23)	Percent
Certain	2	8.7
Probable/likely	15	65.2
Possible	5	21.7
Unlikely	1	4.4
Conditional/unclassified	-	-
Unassessable/ unclassifiable	-	-

Causality assessment of ADRs was done using WHOUMC scale which categorizes ADRs as "certain", "probable", "possible" and "unlikely". Table 8 shows that type of reactions and their percentage are as certain (8.7%), Probable/ Likely (65.2%), Possible (21.7%), and Unlikely (4.4%).

Table 9: Severity of reported ADRs by modified Hartwig and Siegel scale

Type of reaction	No. of patients reported ADR (23)	Percent
Lethal	-	-
Severe	1	4.35
Moderate	9	39.13
Mild	13	56.52

Table 10: Common ADR Reported.

Class of drugs	Adverse events experienced	No of patients	%
CCB	Pedal edema, giddiness, headache, abdominal pain, bradycardia	7	30.4
ARB	Anxiety, Nausea and Vomiting, Headache, Abdominal pain, Restlessness, Itching and inflammatory swelling	4	17.4
ACE Inhibitor	Dry cough, dizziness, headache, drowsiness, diarrhea, hypotension, weakness, cough, rash, metallic or salty taste.	7	30.4
Beta Blocker	Constipation, nausea and vomiting, headache, hypoglycemia, postural hypotension	2	8.7
Diuretics	Hypotension, muscle cramps, headache vertigo, pain in legs, dysuria	1	4.4
Other	Skin reaction	2	8.7

Total 23 patients were reported ADR. 30.4% patients were on Calcium channel blocker inhibitors. 17.4% patients receiving ARB reported side effect.

DISCUSSION

Hypertension is a very common medical condition worldwide and is the principal cause of stroke, is a major risk factor for coronary artery disease and its complications. It is a major contributor to cardiac failure, renal insufficiency, and dissecting aortic aneurysm.^[10, 11] Choice of an antihypertensive drug should be driven by likely benefit in an individual patient, taking into account concomitant diseases such as diabetes mellitus, problematic adverse effects of specific drugs, and cost.^[12] The overall goal of treating hypertension is to reduce hypertension associated morbidity and mortality.

In this study, the maximum number of patients, were from the age

group of 41-60 (55.6%) years followed by 61-80 (37.7%) and least number in 18-40 (6.7%) years of age of patients are from this age group. Whereas, total 90 patients were there, including 74 (82.2) males and 16 (17.8) females (Table 2) and showing a predominance of male population. The hypothetical cause of higher number of male patients is elevated levels of androgen such as testosterone as they play a role in elevation of blood pressure.^[13] A similar study was also conducted by Chobanian AV et al, which is supporting this study.^[14]

Furthermore, maximum number of patients was seen in less than 3 years duration of hypertension followed by 4-6 years of duration and minimum number of patients was seen in more than 7 years of duration. In addition, systolic blood pressure, maximum number of patients in stage 2, followed by stage 1 and hypertensive emergency and lowest number in pre-stage hypertension.

On the other hand, diastolic blood pressure, maximum number of patients in stage 2 followed by stage 1 and hypertensive emergency and lowest number in pre-stage hypertension. In this study, maximum number of patients were on Single drug therapy (47.5%), followed by 32.2% of patients on dual drug therapies, and 12.2% of patients were on triple drug therapy for treatment of hypertension. Calcium channel blocker was the frequently used drug for monotherapy (20%), and the most commonly used drugs in dual drug therapies were CCB+ARB accounting for 13.3%, and 5.6% of patients were on triple drug therapy with CCB+ARB+Diuretic. In a study by Shah J et al, the most commonly prescribed antihypertensive among elderly patients was Amlodipine.^[15] This is also in consonance with the recommendations of the JNC on Prevention, Detection, Evaluation, and Treatment of high blood pressure guidelines which state that low dose of different classes of antihypertensive drugs is more beneficial than a high dose of one.

According to WHO-UMC Scale maximum number of ADRs in probable class followed by possible, unlikely and certain class. Moreover, as per the modified Hartwig and Siegel's scale maximum number of ADRs was mild category and lowest in severe type of reaction was observed in this study. No ADRs were found in lethal type of reaction. These findings were consistent with the literature reported by Almas A et al, Total 23 patients were reported ADR.^[16] In our study 30.4% patients were on Calcium channel blocker inhibitors. 17.4% patients receiving ARB reported side effect.

CONCLUSION

The knowledge and prescription of drug was concluding to be the base line idea of ADRs of antihypertensive drugs in hypertensive patients visiting OPD of tertiary teaching care hospital in India. In this study, Authors can't say that all of the prescriptions found were rational; furthermore, more changes are needed to be done in prescription of antihypertensive drugs are needed in drug prescribing practices in hypertensive patients. Patients are needed to provide information and proper counselling regarding the ADRs of drugs; this would refine the quality of life. However, since this study is mainly limited to pattern of drug usage in hypertensive population in a tertiary care hospital, care must be exercised in generalizing the study results to prescribing pattern of the whole region.

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