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A Prospective Observational Study on Prescribing Patterns of Anti-Hypertensive Drugs in Patients with Hypertension

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ABSTRACT

A prospective observational study was carried out among 180 patients for a period of 6 months at in-patient department of cardiology, Apollo hospital. A total of 180 prescriptions with different co-morbidities were enclosed in the present study who met the inclusion criteria. 63% were male and 37% were female with mean average of 36 ± 23.16. 34.4% of the patients were in the age group of 61-70. The common co-morbidities along with hypertension which were seen in the study are diabetes mellitus (38%), coronary artery disease (31%) and chronic kidney disease (9%). The most commonly prescribed therapy was monotherapy given in 116 patients (64.4%) followed by dual therapy given in 59 patients (32.7%) and triple therapy was given only in 5 patients (2.7%). Among the monotherapy, the various class of drugs prescribed were ARB (34.4%), followed by CCB (32.7%), BB (25.8%), ACE inhibitors (3.45%) and B+A (3.45%). Among the dual therapy, the various class of drug combinations prescribed were ARB+CCB (28.8%), followed by ARB+Di(22%), ACE+CCB (20.3%), CCB+BB(15.2%), ARB+BB(11.8%) and CCB+Di(1.69%). In triple drug therapy the various class of drugs used were ARB+BB+CCB (60%) and ARB+Di+CCB (40%). In the present study, it was found that monotherapy was the most commonly prescribed regimen followed by dual and triple therapy. ARB was the most commonly prescribed class as monotherapy, ARB+CCB as dual therapy and ARB+BB+CCB as triple therapy. In monotherapy, commonly used drug was telmisartan. In dual therapy, commonly used drug combination was telmisartan+amlodipine and in triple therapy, commonly used drug combination was telmisartan+metoprolol+clinidipine.

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INTRODUCTION

Hypertension is a serious health issue worldwide and major risk for many complications and cardiovascular diseases. It is commonly called as 'silent killer' [1, 2]. The force of circulating blood against the artery walls is known as blood pressure.

Hypertension is a condition in which there is persistent elevation of arterial blood pressure [3, 4]. According to recent study in India, hypertension affects 25% of the urban population and 10% of the rural population [5, 6]. The overall incidence of hypertension is similar for both male and female but it varies depending on age [7].

Most of the people with hypertension are often asymptomatic, even if their blood pressure readings are very high. Signs and symptoms associated with BP are: Headache, Blurred vision, Dizziness, Dyspnea, Chest pain, Palpitations [8].

The other symptoms seen are nocturia, peripheral edema, sweating, etc. To improve the blood pres-

sure control, make sure that they self-monitoring of blood pressure takes place at home [9].

Despite the availability of several anti-hypertensive drugs with proven efficacy and safety, only a small fraction of patients may achieve their therapeutic goals [10–12].

Various class of anti-hypertensive drugs with examples are- Angiotensin converting enzyme inhibitors (ACEI); Angiotensin receptor blocker (ARB); Calcium channel blocker (CCB); Diuretics; Beta blockers; Alpha blockers; Alpha-beta blockers; Direct renin inhibitors; Centrally acting drugs; Vasodilators [13].

Combination Therapy

Combination therapy shows more effect than by increasing dose of monotherapy. Healthy lifestyle changes can prevent the onset of hypertension and can also reduce cardiovascular risk [14, 15].

Combination of both DASH diet and low sodium intake has strong impact on lowering the blood pressure [16, 17].

Prescription Pattern Analysis

1. Prescription is one of the most important therapeutic transactions between the physician and a patient.

2. A survey based on prescriptions is one of the most effective ways to assess and evaluate a physician's prescribing attitude.

3. Prescription pattern analysis is an essential tool to provide information regarding the drug use and to ensure rational drug therapy.

4. WHO core indicators helps to improve the prescribing pattern and promote the rational use of drugs in healthcare.

5. It also asses the prescribing skills of the clinicians and this can be done by prescription audit [14].

6. WHO prescription indicators are:

a) Average number of medications prescribed.

b) The proportion of medications given by their generic names

c) Antibiotic-prescribed medications as a percentage of total medicines

d) Percentage of medications prescribed with an injection

e) Prescriptions from the essential drug list

Aims and Objectives

Aim

The study is to determine how anti-hypertensive drugs are prescribed to patients with hypertension.

Objectives

1. To analyze the most commonly used prescribing pattern (mono/combination therapy) of anti-hypertensive drugs given.

2. To analyze the most commonly used class of antihypertensives.

3. To determine which anti-hypertensive drug is most commonly prescribed.

4. To evaluate the current use of anti-hypertensive drugs, as well as its rational use.

METHODOLOGY

Study Design

A prospective observational study was conducted to study the prescribing patterns of anti-hypertensive drugs in hypertension patients.

Study Site

The study was carried out at Apollo hospitals IP department of cardiology (Jubilee hills).

Study Period

The study was carried out for six months.

Sample Size

The study included a total sample size of 180 people.

Selection Criteria

The study is carried out based on the following criteria:

Inclusion Criteria

1. Patients with Hypertension and other comorbidities; 2. Patients from age 31-80 years

Exclusion Criteria

1. Pregnant and lactating women; 2. Patients with age ≤ 30 years

Tools Used

Microsoft Excel 2007.

Source of Data

All the patients who met the inclusion criteria were selected from inpatient department.

All the necessary data was collected from the patients in the data collection form which is presented in annexure.

Study Procedure

A prospective observational study was carried out over a period of six month. Patients admitted to the IPD were enrolled and selected according to the inclusion criteria. Basic demographic details, all the necessary data and medication chart data was collected in the data collection forms. All the patients enrolled in the study were divided according to their gender, age (31-80 Y), stages of hypertension and therapy (mono/dual/triple) given. An analysis was done to analyze the prescribing patterns of anti-hypertensive drugs. Data collected was then subjected to the statistical analysis and interpretations of results were shown.

Statistical Analysis

The data collected from the patients were first written in data collection form and then entered into Microsoft Excel sheet. Statistical analysis was done by calculating the mean and standard deviation.

Ethics Approval

The study protocol was prepared, submitted and approved by the ethics committee.

RESULTS AND DISCUSSION

Among all the patients enrolled in the study, majority of the patients were males (63%) and remaining were females (37%), represented in Table 1.
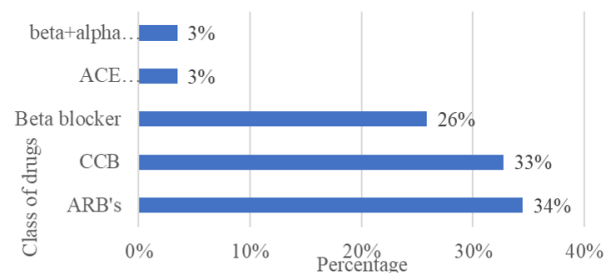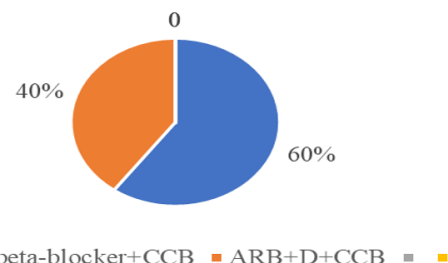

Figure 1: Graphical Representation of Various Classes of Anti-Hypertensive Drugs Prescribed as Monotherapy
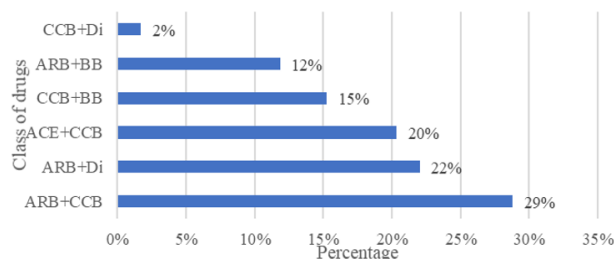
Figure 2: Graphical Representation of Various Classes of Drugs prescribed as Dual Therapy

The data in this study is assessed using the chi-square test to determine relationship between the


Figure 3: Pictorial Representation of Various Classes of Drugs used as Triple Therapy

variable SBP and both genders and DBP and both genders was found to be significant at $p < 0.05$. In both SBP and DBP, males were shown to have a higher prevalence of Stage-1 was than females. The prevalence among males and females is given in the Table 2. SBP and gender chi-square=8.17($p < 0.05$), DBP and gender chi-square=7.26($p < 0.05$). Both are significant.

Among all the patients enrolled in the study, they are divided based on prescribing patterns like monotherapy, dual therapy and triple therapy. Monotherapy was prescribed to the majority of patients (64%) followed by dual therapy (33%) and triple therapy (3%). Monotherapy was prescribed in 116 patients. The various classes of drugs prescribed were depicted in Figure 1. Most commonly prescribed class of drug as dual therapy was depicted in Figure 2. Most commonly prescribed triple therapy is depicted in Figure 3. In this study, we have observed that as monotherapy, telmisartan (29%) was mostly prescribed, followed by amlodipine (21%), metoprolol (20%), cilnidipine (12%) and least prescribed drug was ramipril (3%) and atenolol (3%).

In this study, we have found that the most commonly prescribed anti-hypertensive drug as dual therapy was depicted in Figure 4. In this study, we have observed that triple therapy was least prescribed and the most commonly prescribed drugs in triple therapy was depicted in Figure 5.
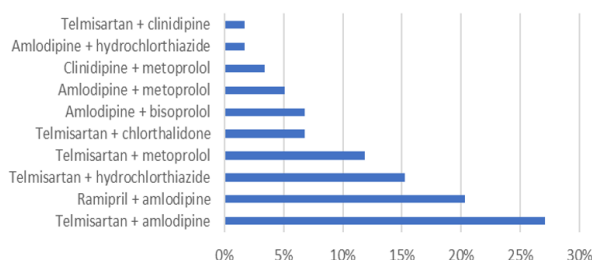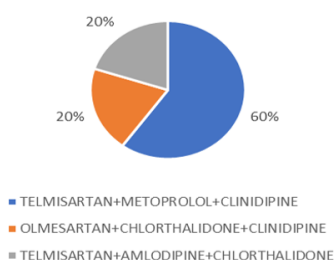

Figure 4: Graphical Representation of Commonly prescribed Anti-Hypertensive Drugs in Patients Receiving Dual Therapy

Table 1: Gender Wise Categorization of Patients

Gender	No. of Patients	Percentage
Male	113	63%
Female	67	37%
Total	180	

Table 2: Prevalence of Hypertension Among Males and Females

BP	Males				Females			
	SBP	%	DBP	%	SBP	%	DBP	%
Pre-hypertensive	45	39.82%	39	34.51%	26	38.81%	17	25.37%
Stage 1	59	52.21%	51	45.13%	26	38.81%	24	35.82%
Stage 2	9	7.96%	23	20.35%	15	22.39%	26	38.81%

Figure 5: Pictorial Representation of Commonly Prescribed Anti-Hypertensive Drugs in Patients Receiving Triple Therapy

CONCLUSION

In the summary, we conclude that in this study, monotherapy was most commonly prescribed pattern of anti-hypertensive drugs. Monotherapy can successfully lower the blood pressure in most of the patients with mild-moderate hypertension. Angiotensin II receptor blockers (ARB) are the most often prescribed drug class. ARB lowers blood pressure by blocking angiotensin II from attaching to the angiotensin receptors in the muscles and surrounding blood vessels. To counteract the effects of the peptide hormone angiotensin-II, they mainly target the AT-1 g-protein couple receptors. Commonly prescribed anti-hypertensive drug was telmisartan. It is ARB which has half-life of 24 hours and has long duration of action thus control blood pressure throughout the day on once daily dose. Telmisartan is unique in that it is a selective regulator of the peroxisome proliferation activated receptor gamma (PPAR-γ) which is found mostly in adipose tissue, colon and macrophages. It plays a key role in of insulin and glucose metabolism. Telmisartan controls the early morning blood pressure urge more effectively and this has greater effect to minimize the cardiovascular risk. Based on our study of analyzing prescribing pattens of anti-hypertensive drugs it seems to be according to the JNC VIII standard guidelines.

Conflict of Interest

The authors declare that there is no conflict of interest.

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