



ISSN NO. 2320-5407

Journal homepage: <http://www.journalijar.com>

INTERNATIONAL JOURNAL  
OF ADVANCED RESEARCH

## RESEARCH ARTICLE

## Prescription pattern of Anti-hypertensive drugs in a tertiary care hospital

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### Manuscript Info Abstract

#### Manuscript History:

Received: 25 July 2014  
Final Accepted: 26 August 2014  
Published Online: September 2014

#### Key words:

anti-hypertensive drugs,  
hypertension, prescribing pattern,  
prescription monitoring

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**Background:** Elevated Blood pressure is one of the most important modifiable risk factors for cardiovascular diseases. Recently a number of newer and effective anti-hypertensive medications have come into practice. Therefore it is important to find out patient compliance, recent trends in prescribing anti-hypertensive medications and its effectiveness in upcoming medical practice.

**Objective:** To evaluate the recent trends in prescribing anti hypertensive drugs, in outpatients in the Departments of General Medicine and Cardiology at a tertiary care hospital.

**Methods:** The present study was a cross sectional observational study. This was conducted in the Departments of Cardiology and General Medicine, Pondicherry Institute of Medical Sciences (PIMS), Puducherry. Adult patients diagnosed to have mild to severe systemic hypertension and on treatment without any other co morbid conditions of either sex attending the out patient clinic were included in the study. The study duration was three months with a sample size of 300 patients. The following data were obtained from their outpatient files: Demographic details, BP, drugs used to treat the elevated BP. The data will be presented as descriptive statistics.

**Results:** Majority of patients were between the age groups of 41-60 years. Amongst them 84% of male patients and 61.90% of female patients had good control of BP with anti-hypertensive therapy. 71.70% of patients had their BP within the normal range with a single anti-hypertensive drug. The most commonly prescribed drug is calcium channel blockers followed by beta-blockers, ACE inhibitors, ARBs and diuretics. The most commonly used combination is calcium channel blocker with beta-blocker.

**Conclusion:** The present study represents the current prescribing trend for anti-hypertensive agents. The use of single anti-hypertensive has been found to provide good control of blood pressure in majority of patients, but about 28% of patients required more than one drug for blood pressure control.

Though the rate of usage of AR blockers and ACE inhibitors has been increasing, the Calcium channel blockers and  $\beta$  blockers top the list in the most commonly prescribed anti-hypertensive agents.

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## Introduction

Hypertension is a common disease that is simply defined as persistently elevated arterial blood pressure (BP).  
<sup>[1]</sup>Elevated Blood pressure is one of the most important modifiable risk factors for cardiovascular diseases. Various factors like behavioral, cultural, nutritional and lifestyle have led to a dramatic increase in the cardiovascular diseases throughout the world. Recently a number of newer and effective anti-hypertensive medications have come

into practice. Therefore it is important to find out patient compliance, recent trends in prescribing anti-hypertensive medications and its effectiveness in upcoming medical practice.

### Objectives:

To evaluate the recent trends in prescribing anti-hypertensive drugs in outpatients in the Departments of General Medicine and Cardiology at a tertiary care hospital.

### Subjects and Methods:

- Cross sectional observational study.
- Sample size: 300 patients (outpatients).
- Place: Departments of Cardiology and General Medicine, Pondicherry Institute of Medical Sciences (PIMS).
- Duration: 3 months.
- Study population: Adult patients of either sex in the age group of 20 to 80 years who have been diagnosed to have mild to severe systemic hypertension and on treatment without any other co morbid conditions.
- Exclusion criteria: Patients with co-morbid conditions were excluded from the study.
- Data obtained: Age, sex, BP, drugs used to treat the elevated BP (including dose of the drug).
- Drug/Drug combinations included: Diuretics,  $\beta$ -blockers (BBs), calcium channel blockers (CCBs), angiotensin-converting enzyme inhibitors (ACE Inhibitors), angiotensin receptor blockers (ARBs), and other anti-hypertensives.

### Results:

During the whole study period, a total of 300 files were scrutinized.

Figure 1:

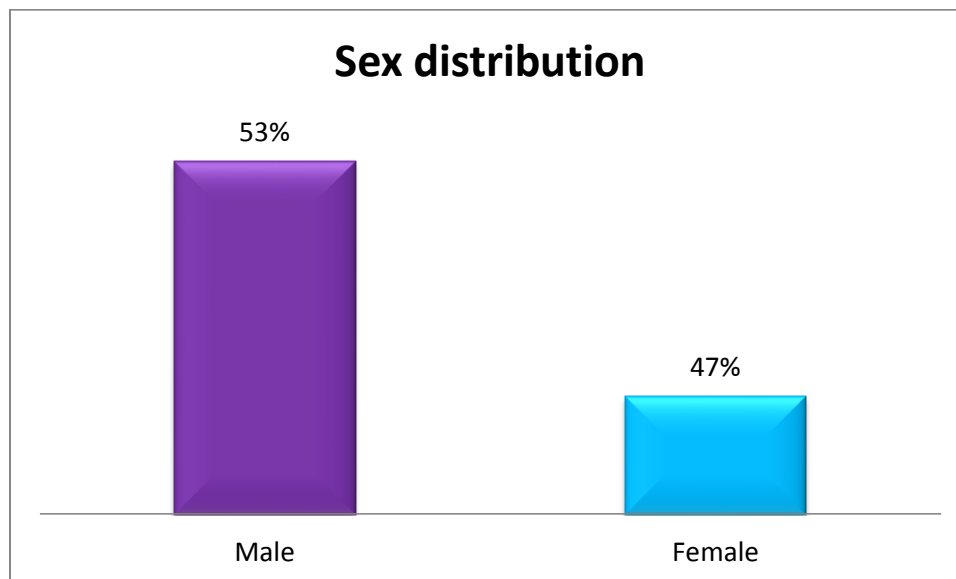


Fig. 1 shows the sex distribution of the patients. Among the 300 patients 53% were males and 47% were females

Figure 2:

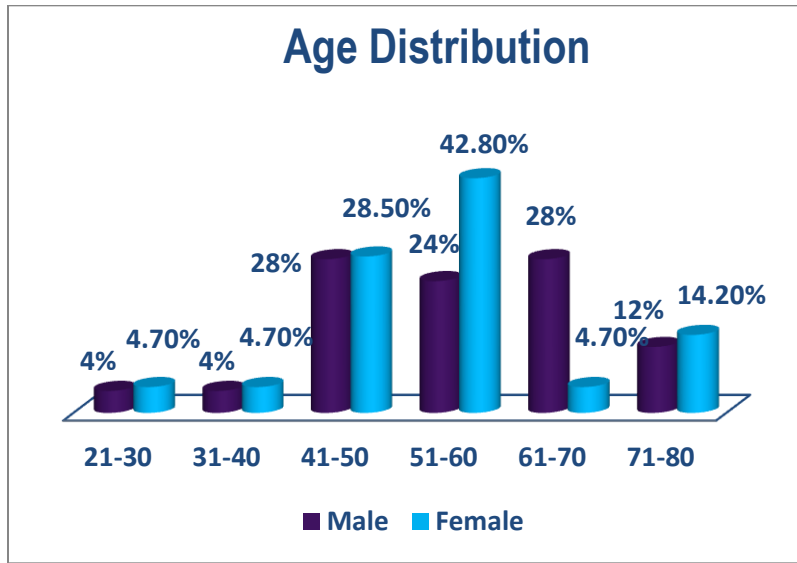


Fig. 2 shows the age distribution of the patients. 28% of male patients were between both 41-50 years and 61-70 years each. Maximum number of female patients were between 51-60 years which was 42.8%.

Figure 3:

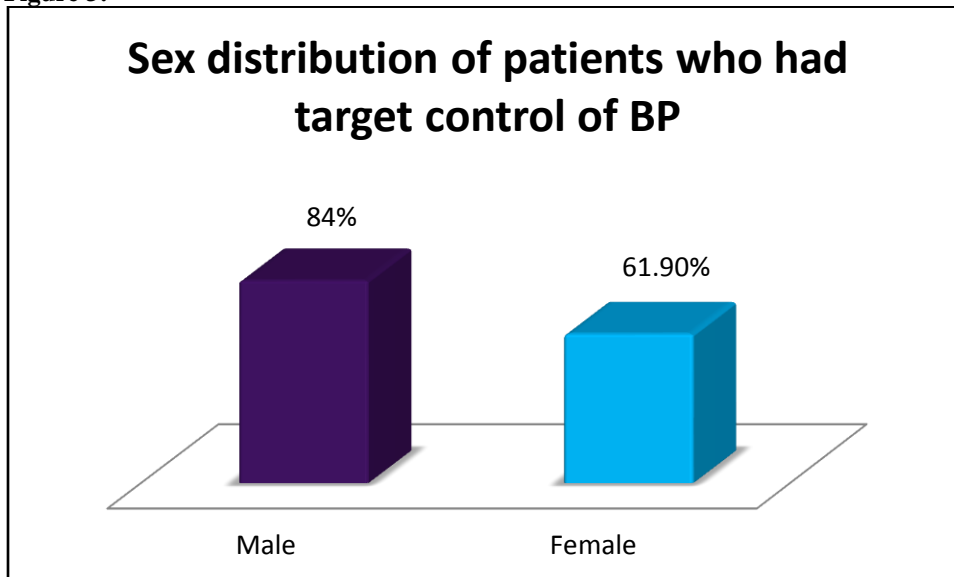


Fig. 3 shows the sex distribution of patients who had target control of blood pressure (BP) (ie< 140/90 according to JNC 8 guidelines). 84% of male patients and 61.9% of female patients had their target control of BP.

Figure 4:

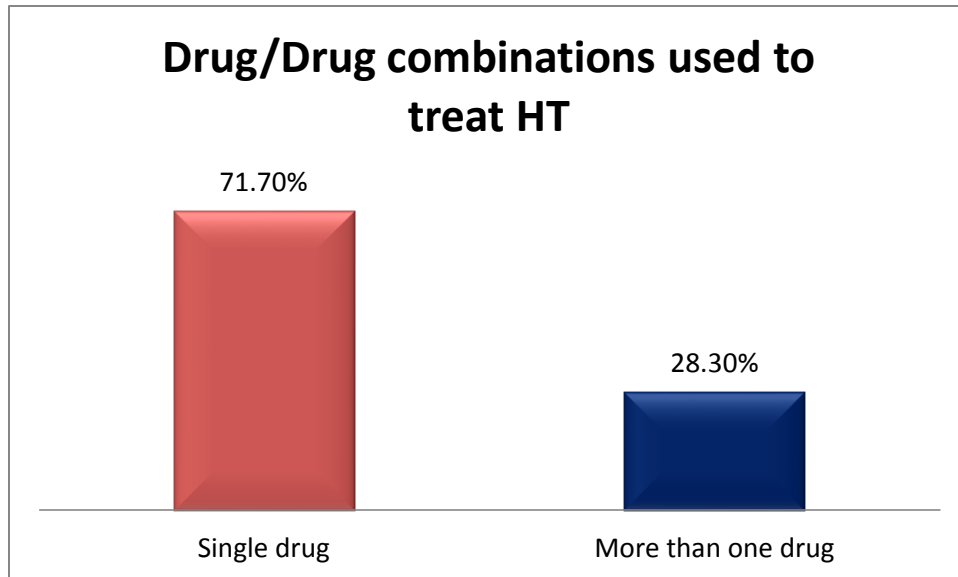


Fig. 4 shows the anti-hypertensive drugs used as single agent or in combination. Of the 300 patients 71.7% of them received only one drug and 28.3% of them received more than one drug for their treatment. Fixed dose combinations were considered as more than one drug.

Figure 5:

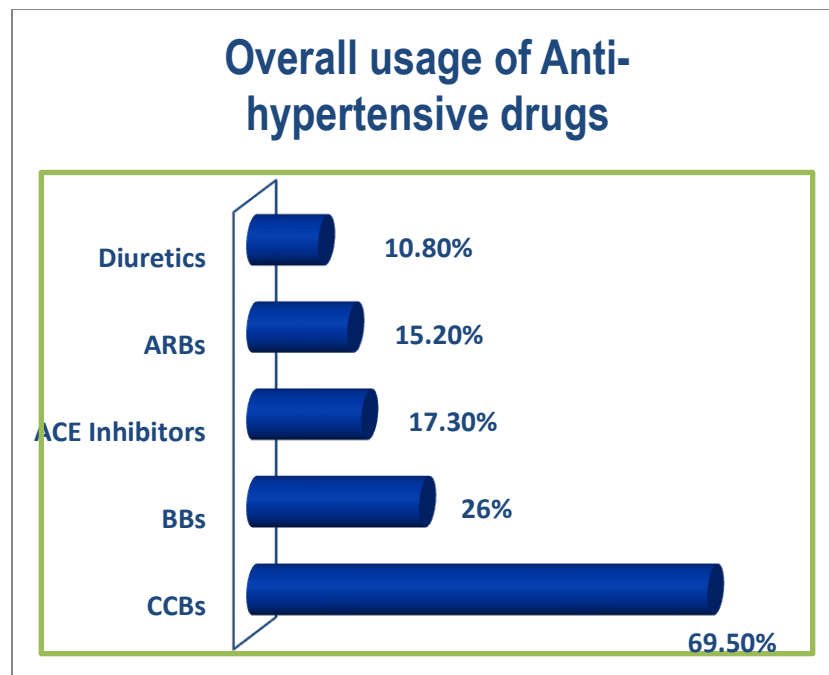
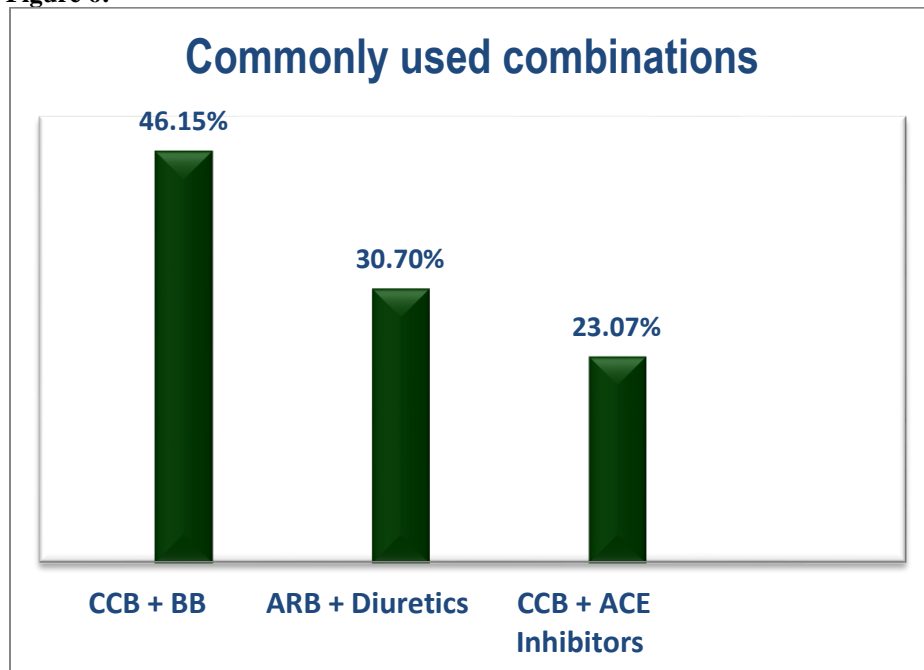


Fig. 5 shows the overall usage of the anti-hypertensive drugs. Five classes of drugs were used namely: calcium channel blockers in 69.5% of the patients followed by  $\beta$ -blockers in 26%, ACE inhibitors in 17.3%, ARBs in 15.2% and lastly diuretics in 10.8%.

**Figure 6:**

**Fig. 6 shows the two drug combinations used in the treatment of the patients. The three different two drug combinations were as follows: calcium channel blocker with a  $\beta$ -blocker in 46.15%, ARB with a diuretic in 30.70% and calcium channel blocker with a ACE inhibitor in 23.07%.**

## Discussion:

A prescription-based survey is considered to be one of the most effective methods to assess and evaluate the prescribing attitude of physicians. <sup>[2]</sup>Continuous audit of the prescriptions and the pattern of prescribing are necessary for enabling rational use of the drugs by the physicians. In the present study it was observed that hypertension was more prevalent in females than in males, which is in accordance with the study done by H Tiwari et al. <sup>[3]</sup>Monotherapy and combination therapy were both used at rates of 71.70% and 28.30% respectively. The results were supported by the study done by H Tiwari et al was more number of patients was on single anti-hypertensive drug than combination drugs. <sup>[3]</sup>The present study revealed that calcium channel blockers (69.5%) were the drugs of choice for hypertensive patients as a single drug therapy, followed by  $\beta$ -blockers (26%). This study showed that overall usage of ACE inhibitors was 17.30% as monotherapy, which was lesser in number as compared to other drugs such as calcium channel and  $\beta$ -blockers. Diuretics are generally recommended as first-line therapy for treatment of hypertension (JNC 8). Use of diuretics in the present study was 10.80% as monotherapy. Lesser use of diuretics in the present study may be due to adverse effect of diuretics on glucose homeostasis and lipid profile. <sup>[4]</sup>

In two-drug combinations, a  $\beta$ -blocker with a calcium channel blocker were most often prescribed (46.15%), followed by a ARB with a diuretic (30.70%) and calcium channel blocker with ACE inhibitor (23.07%). The two-drug regimen, i.e. atenolol and amlodipine combination, was most often prescribed. The combination of these two drugs have synergistic effects. The fixed combination of  $\beta$ -blocker and calcium channel blocker provides efficiency and tolerability in the treatment of arterial hypertension. <sup>[5]</sup>

In the present study the use of single anti-hypertensive has been found to provide good control of blood pressure in majority of patients, however 28% of patients required more than one drug for blood pressure control. The data from the present study shows that the prescribing pattern is not in concordance with the JNC 8 guidelines. Though the rate of usage of AR blockers and ACE inhibitors has been increasing, the Calcium channel blockers and  $\beta$  blockers top the list in the most commonly prescribed anti-hypertensive agents.

**Conclusion:**

- The present study represents the current prescribing trend for anti-hypertensive agents.
- The use of single anti-hypertensive has been found to provide good control of blood pressure in majority of patients, but about 28% of patients required more than one drug for blood pressure control.
- Though the rate of usage of AR blockers and ACE inhibitors has been increasing, the Calcium channel blockers and  $\beta$  blockers top the list in the most commonly prescribed anti-hypertensive agents.
- The commonly used combination is calcium channel blocker with beta blocker.

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