

**A CROSS-SECTIONAL STUDY OF PATIENTS RECEIVING TREATMENT FOR HYPERTENSION AND ITS COMPLICATIONS: PROFILING CASES IN A TERTIARY CARE HOSPITAL LOCATED IN MANDYA****Pavan G. K.<sup>1</sup>, Dr. Manu P. R.<sup>2\*</sup>, Poorva S.<sup>1</sup>, Sandeep S.<sup>1</sup> and Dr. Arpitha T. K.<sup>2</sup>**<sup>1</sup>Pharm D Degree Obtained from Bharathi College of Pharmacy Located in Bharathinagara, Mandya, Karnataka-571422.<sup>2</sup>Employed as an Assistant Professor in the Department of Pharmacy Practice at Bharathi College of Pharmacy in Bharathinagara, Mandya, Karnataka-571422.**\*Corresponding Author: Dr. Manu P. R.**

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**ABSTRACT**

**Background:** Our study aims to estimate the treatment and adequate control of hypertension among the study subjects. Hypertension means elevated systemic blood pressure that often has no symptoms, resulting from the physical force exerted by the blood on the arterial walls of the heart. A blood pressure reading that shows nearly to 120/80 mmHg is considered normal. It is alarming that globally, more than 1 billion adults presently have hypertension, and this number shows that it will increase to 1.5 billion in the next decade. Earlier reports indicate a rapid rise in hypertension prevalence in developing countries, making it a significant cause of death and disability. To describe the profile of patients receiving treatment for hypertension and associated complications. And also to describe the treatment pattern involved in it. **Objective:** To describe the stages of hypertensive patients. And to describe the medications given to hypertension patients. Additionally, this is to provide information on the medication used for patients admitted to MIMS Mandya who have hypertensive complications. **Methods and Methodology:** A cross-sectional study consisting of 355 cases of hypertension and related complications was conducted at the Department of General Medicine, MIMS Mandya, between July 2023 and December 2023. The findings revealed that the higher number of patients comes under the age range of 60-69, with 49 (13.8%) males and 63 (17.7%) females. The majority of the complications were HTN+DM+others (87, or 24.50%). The majority of patients come under Stage 1 rather than Stage 2. A greater number of people under monotherapy were treated with CCB (i.e., amlodipine) and combination therapy was treated the majority wise 47.83% ACE+CCB+BetaBlockers. The most common HTN-associated complications were treated with aspirin, clopidogrel, and atorvastatin. **Conclusion:** In a total of 355 cases, Stage 1 is more than Stage 2. The majority of the patients with monotherapy were treated with CCB. Combination therapy is mostly treated with ACE, CCB, and beta blockers. HTN-associated complications patients were treated more with aspirin, Clopidogrel, and atorvastatin.

**KEYWORDS:** Hypertension, complications, treatment, cross-sectional, MIMS.**INTRODUCTION**

Hypertension, as per the criteria set by the World Health Organization (WHO), is characterized by elevated blood pressure, specifically when it reaches 140/90 mmHg or higher. Although it is a prevalent condition, if left untreated, it can have serious consequences. Hypertension typically does not show any symptoms and is defined by the exertion of physical force by the blood on the arterial walls of the heart. A blood pressure reading if shows nearly 120/80 mmHg is considered normal.<sup>[1]</sup>

**Causes of High Blood Pressure<sup>[2]</sup>**

Conditions that may lead to kidney impairment, diabetes, chronic kidney infections, sleep apnea, glomerulonephritis, and hormone disorders like Hypothyroidism, Hyperthyroidism, Cushing's syndrome, acromegaly, and phaeochromocytoma. Other contributing factors can be Autoimmune disorders (lupus, scleroderma) and by the use of contraceptives, steroids, and non-steroidal anti-inflammatory drugs like ibuprofen, aspirin, and naproxen.

**Symptoms of High Blood Pressure<sup>[4]</sup>**

1. Cluster headaches
2. Epistaxis
3. Fatigue
4. Eyesight problems
5. Chest pain
6. Dyspnea
7. Arrhythmia
8. Hematuria
9. Pounding in the chest, neck, or ears
10. Seizures
11. Vertigo
12. Nervousness
13. Sweating
14. Trouble sleeping
15. Facial flushing
16. Blood spots in eyes.

**Complications of High Blood Pressure<sup>[5]</sup>**

1. Cardiac disease
2. Cardiac failure
3. Stroke
4. Aneurysm
5. Kidney disease
6. Vision impairment
7. Peripheral arterial disease
8. Cognitive impairment
9. Sexual impairment
10. Metabolic syndrome

**Risk Factors for High Blood Pressure<sup>[6]</sup>**

Obesity or excessive weight, excessive sodium intake, inadequate potassium consumption, lack of physical activity, excessive intake of alcohol consumption, stress, and the use of non-steroidal anti-inflammatory drugs (NSAIDs) are factors that contribute to the following health issues.

**Incidence and Prevalence**

The WHO estimated in 2008 that the occurrence of high blood pressure in India was 32.5%, with men at 33.3% and women at 31.7%. Nevertheless, a study conducted in multiple centres which placed in India on hypertension awareness, treatment, and control found that only around 25.6% of patients receiving treatment were effectively managing their blood pressure.<sup>[8]</sup>

According to the Global Burden of Hypertension of 2005 study,<sup>[7]</sup> the GBD of year 2010 study,<sup>[11]</sup> and WHO 2011 NCD India-specific data,<sup>[11]</sup> show a concerning increase in hypertension rates. This is particularly worrying for the 17.8% of the world's population residing in India. A previous systematic analysis of hypertension prevalence in India, covering studies published between 1969 and July 2011 found a range of 13.9 to 46.3% in urban areas and 4.5 to 58.8% in rural areas.<sup>[13]</sup> These regional variations are also observed in cardiovascular diseases. For instance, mortality and prevalence rates for coronary heart disease (CHD) and stroke differ across regions in India, with higher CHD mortality in south India and higher stroke rates in eastern India,<sup>[14]</sup> Urban areas also tend to have higher CHD prevalence compared to rural areas.<sup>[14]</sup> Therefore in this study, we can know their objective was to conduct a systematic review and meta-analysis to determine the overall prevalence of hypertension in rural and urban parts of India, as well as assess awareness, treatment, and control of blood pressure among Indian individuals with hypertension.

We can visualize in one of these studies that nearly 63% of total deaths in India are due to non-communicable diseases, of which 27% are prone to cardiovascular

disease, which affects 45% of people in the 40-69 age group. High blood pressure is one of the most important risk factors for CVDs. Moreover, it remains poorly controlled due to a lack of appropriate care through primary care and poor follow-up.<sup>[9]</sup>

In India, only around 12% of individuals with hypertension effectively manage their blood pressure. Uncontrolled blood pressure poses a significant risk for cardiovascular diseases (CVDs) like heart attacks, strokes and which account for approximately one-third of all deaths in India.<sup>[12]</sup>

To effectively prevent chronic diseases, it is crucial to recognize the interplay of various risk factors such as the growing elderly population, mechanization, sedentary lifestyle, and dietary changes. Identifying these risk factors is essential, and this study aims to gather information on hypertension-related disorders in MIMS Hospital, Mandya. Additionally, it will assess the level of awareness and control of hypertension among the participants of the study.

**METHODS**

The study was carried out at the MIMS a 1,200-bed tertiary care teaching hospital that offers various specialities such as medicine, surgery, orthopaedics, paediatrics, obstetrics, and gynaecology. Following specific criteria for including and excluding participants, a total of 355 cases were gathered. Prior approval from the "Ethics Committee" at MIMS Teaching Hospital in Mandya was obtained to ensure ethical standards. Data will be obtained from patients admitted to the general medicine department who have provided informed consent. This includes patients with hypertension-related disorders as well as both males and females aged 18 years and above. Pregnant or breastfeeding patients and those with incomplete data have been excluded from the study. The present study utilized appropriate parametric statistics such as the mean for descriptive purposes. To obtain the conclusion of our study, a straightforward percentage calculation will be performed. Microsoft Excel will be used to input the

data, while Word is employed to produce visual representations such as graphs and tables.

## RESULT

### Gender Distribution Among the Patients

A total number of 355 patient data was collected from MIMS hospital during six months. Among the whole

355, 172 (48.45%) were males and 183 (51.54%) were females. This study shows that women are more susceptible to serious medical illnesses.

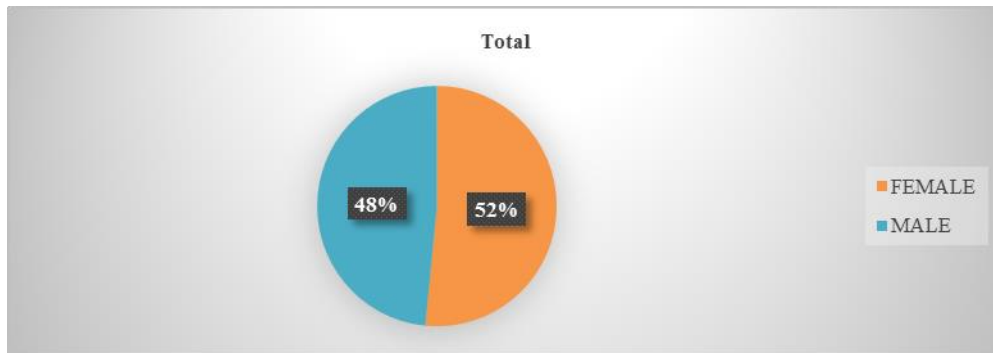


Figure 1: Gender Distribution.

### Age Distribution of Patients

Out of 355 patients included in the study, there were 5 male and 9 female patients in the age group of 30-39. The next age group, 40-49, had 23 male and 17 female patients. For the age group of 50-59, there were 37 male and 35 female patients. In the 60-69 age group, the study found 49 male and 63 female patients. Moving on, the

70-79 age group had 43 male and 40 female patients. In the 80-89 age group, there were 14 male and 15 female patients. Lastly, only 1 male and 4 female patients were found in the 90-99 age group. Overall, all the patients were categorized into seven different age groups, with the largest number of patients falling in the 60-69 age group and the smallest number in the 90-99 age group.

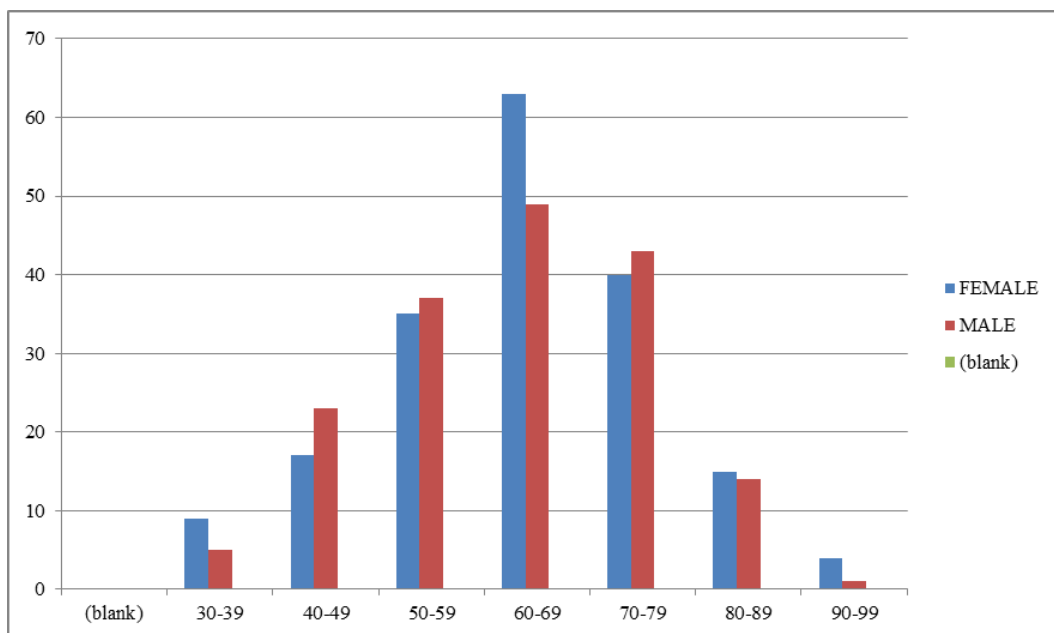


Figure 2: Age Distribution.

### Distribution of Patients Based on Stages of Hypertension

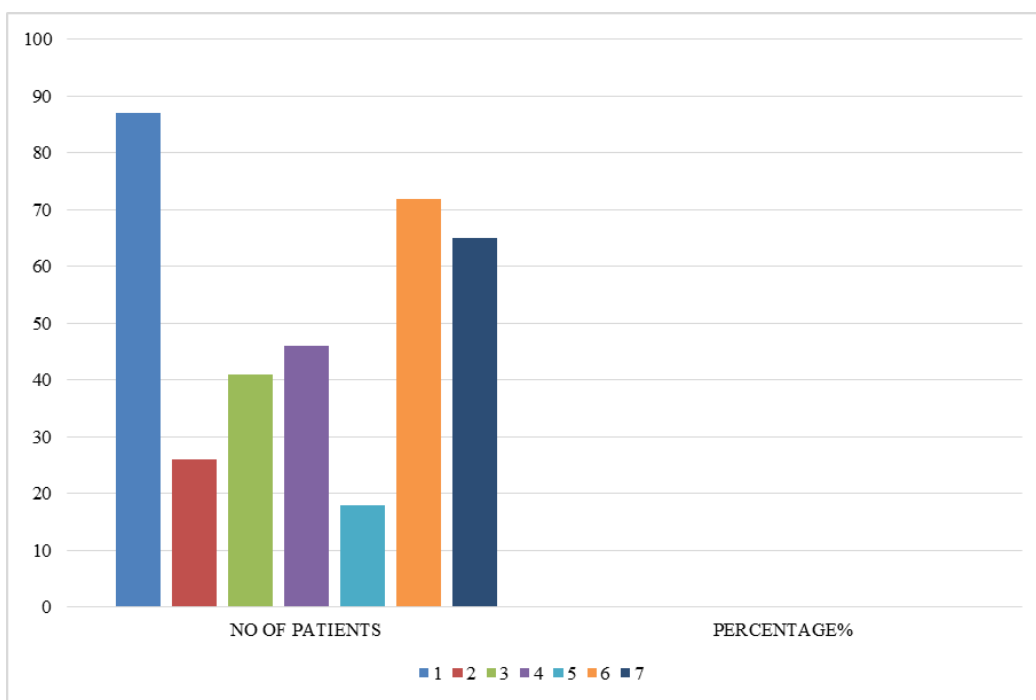
In Mandya MIMS Hospital, of the total 355 cases, 334 patients come under Stage 1 (94.08%) and 21 patients come under Stage 2 (5.91%), respectively.

**Table 1: Stages Of Hypertension.**

Stages Of Hypertension	No Of Patients	Percentage %
Stage 1	334	94.08%
Stage 2	21	5.91%

**Distribution of Patients Based on Comorbidity condition**

Regarding comorbidity, 24.50% of patients suffered from HTN, DM, and others, and 11.54% suffered from HTN with CVS and other diseases.



**Figure 3: Comorbidity Distribution.**

**Classification of Treatment for Hypertension**

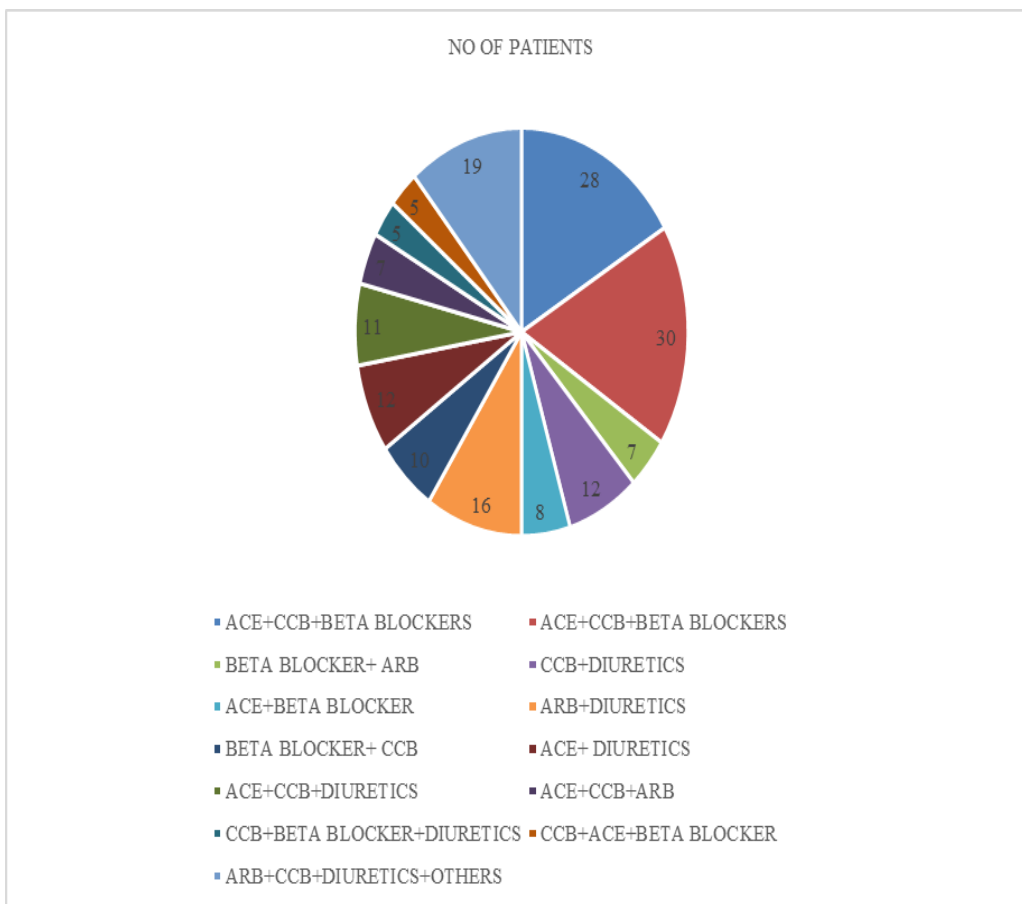
In the management of HTN, combination therapy was referred, with a management rate of 47.83% with combination therapy and 52.08% with monotherapy, including ACE inhibitors (15.77%), beta blockers (3.09%), diuretics (2.25%), CCB (22.81%), and ARB inhibitors (8.16%).

**Table 2: Classification Of Treatment.**

Class	No Of Patients	Percentage
Monotherapy	00	00%
ACE Inhibitors	56	15.77%
Beta Blockers	11	3.09%
Diuretics	08	2.25%
CCB	81	22.81%
ARB Inhibitors	29	8.16%

**Combination Therapy for Hypertension**

47.83% of cases treated with combination therapy include ACE+CCB+BETA blockers, ARB inhibitors, diuretics, and others.



**Figure 4: Combination Therapy for HTN.**

**Classification of Treatment for Hypertension-Associated Complications**

In the management of HTN-Associated Complications cases, they were treated with Aspirin+Clopidogrel+Atorvastatin (44.50%), NEB-Duolin and Budecort (25.07%), Inj.Xone (18.59%), Inj.

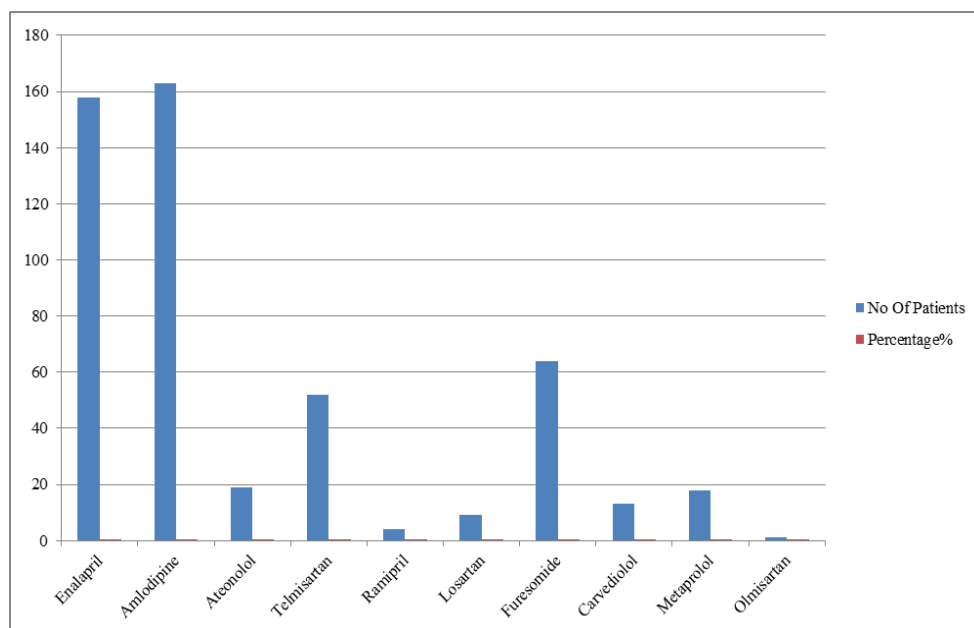
Mannitol (13.52%), Udiliv+Liver Forte (3.94%), Inj. Labetalol (15.49%), Metformin+other Diabetic Drugs (18.02%), H. Actrapid (14.36%), T. Eptoin (5.07%), Sporolac+Ondem+Rantac+Others (26.76%), Diuretics (24.22%), and Antibiotics (9.85%).

**Table 3: Treatment for Hypertension Associated Complications.**

Class Of Drugs	No Of Patients	Percentage %
NEB-Duolin and Budecort	89	25.07%
Inj.Xone	66	18.59%
Aspirin+Clopidogrel+Atorvastatin	158	44.50%
Inj.Mannitol	48	13.52%
Udiliv+Liver Forte	14	3.94%
Inj.labetalol	55	15.49%
Metformin+Other Diabetic drugs	64	18.02%
H.Actrapid	51	14.36%
T.Eptoin	18	5.07%
Sporolac+Ondem+Rantac+Others	95	26.76%
Diuretics	86	24.22%
Antibiotics	35	9.85%

**Types of antihypertensive drugs**

In Mandya MIMS Hospital, enalapril, amlodipine, and furosemide are the major drugs used to treat hypertension, with 44.50%, 45.91%, and 18.02%, respectively.



**Figure 5: Types of Antihypertensive Drugs.**

## DISCUSSION

Our research demonstrates clear evidence of an increasing prevalence of hypertension among the rural population of Mandya, particularly among the elderly. We found that the rate of hypertension rises with age, with the highest percentage (31.5%) occurring between the ages of 60 and 69, and 23.3% occurring between the ages of 70 and 79. Our study also revealed that 94.08% of patients had stage 1 hypertension, while 5.91% had stage 2 hypertension. The presence of comorbidities significantly influenced the prevalence of hypertension, with 24.50% of patients experiencing hypertension along with diabetes mellitus and other conditions, 20.28% experiencing hypertension along with respiratory and cardiovascular diseases, 18.30% experiencing hypertension with other conditions, 12.95% experiencing hypertension with central nervous system disorders and other conditions, and 11.54% experiencing hypertension with cardiovascular diseases and other conditions.

The main medications prescribed for monotherapy included ACE inhibitors, beta-blockers, diuretics, calcium channel blockers (CCBs), and ARB inhibitors. For combination therapy, prescribers commonly use ACE inhibitors, CCBs, beta-blockers, ARB inhibitors, diuretics, and other medications. Among the combinations used, the most prevalent were ACE inhibitors and CCBs, accounting for 8.45% of total cases. The primary antihypertensive drugs utilized in treatment were enalapril, amlodipine, and furosemide.

## CONCLUSION

The main objective of our study was to raise awareness among healthcare professionals about the importance of considering hypertension and its associated complications. Hypertension is common among patients with other health issues and can hurt their overall well-being, physical activity, and the severity of their

underlying diseases. Our study, which included 355 patients with hypertension and associated complications, found that a majority of them were female and the highest number of patients fell within the age range of 60-69. Most patients had moderate hypertension, according to WHO guidelines. The majority were classified as stage 1, while a small percentage were categorized as stage 2. The most prevalent comorbidity or complication was hypertension along with diabetes and other conditions. The main treatment for the patients was a calcium channel blocker, specifically amlodipine, and many of them received combination therapy. Aspirin, clopidogrel, and atorvastatin were commonly prescribed for hypertension-related complications. To effectively prevent these complications, it is crucial to identify the risk factors associated with them. This study aims to provide insights into hypertension-related complications at MIMS Hospital in Mandya, and also examine the level of awareness and control of hypertension among the participants.

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