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## A Study on Prescription Pattern of Antihypertensive Agents in Pregnant Women in Tertiary Care Teaching Hospital



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**Keywords:** Hypertension, Pregnancy, Antihypertensive, Prescription Pattern, Labetalol

### ABSTRACT

**Introduction:** Hypertension is a basic pathology that may exist before or may appear for the first time during pregnancy. Hypertension occurs in 5 to 10% of pregnancies. Hypertension in pregnancy can lead to miscarriage and other maternal and fetal complications. Antihypertensive drugs are prescribed during pregnancy to reduce the progression to severe hypertension which may lead to serious health issues for the mother as well as the fetus. Although treatment with antihypertensive drugs benefits the mother, it carries a potential risk to the fetus. Hence our study aims to assess the prescription pattern of Antihypertensive agents in pregnant women in tertiary care teaching hospitals. **Methods:** It is a prospective observational study conducted in an inpatient department of Obstetrics and Gynecology. The required details were collected in a well-designed data collection form. The obtained data were subjected to suitable statistics. **Result:** A total of 103 pregnant women were enrolled in the study. It is observed that hypertension is more common in pregnant women of the age group 26-30. 9(8.74%) were having mild hypertension, 45(43.69%) of pregnant women were having moderate hypertension and 49(47.57%) of pregnant women were having severe hypertension. Pharmacotherapy revealed that out of 103 patients 52(50.49%) patients were treated with monotherapy and 51(49.51%) patients were treated with two-drug therapy. The most commonly prescribed class of Antihypertensive drug in both monotherapy and two drug therapies were Beta Blocker and the most commonly prescribed drug was Labetalol. **Conclusion:** The present study concludes that the majority of the Antihypertensive drug prescribed belongs to the class Beta-Blockers followed by Calcium-Channel Blockers. Labetalol was the commonest prescribed Antihypertensive in monotherapy followed by Nifedipine and Amlodipine. The present study also concludes that Antihypertensive agents were rationally prescribed.

## INTRODUCTION

The most common disorder found among pregnant women nowadays is hypertension disorder which is one of the major causes of prenatal and maternal morbidity and mortality. The condition in which systolic blood pressure is found to be greater than 140 mmHg and diastolic pressure is found to be greater than 90 mmHg can be termed as hypertension in pregnancy. Several risk factors are associated with increased risk of hypertension in pregnancy such as the presence of type1 diabetes, gestational diabetes, twin birth, and obesity.<sup>1</sup>

Hypertension in pregnancy can lead to miscarriage, preterm deliveries, and other maternal and fetal complications. Mothers with chronic hypertension can inherit lifelong cardiovascular risk. Pharmacotherapy in pregnancy is a special concern because of the potential risk of teratogenicity with treated drugs and the altered physiological state of the mother. Exposure to medications, alcohol and other exogenous factors that harm developing fetus may be ascribed to 10% of congenital anomalies. Because of the potential risk of teratogenicity, FDA has categorized drugs into categories A, B, C, D, E, and X depending on the evidence of fetal risk in various animal studies. The study of prescribing patterns is a component of medical audit to achieve rational and cost-effective medical care, which seeks monitoring in the prescribing practices of the prescribers.<sup>2</sup>

Hypertension in pregnancy is of following major types:

1. Chronic hypertension: Blood pressure (BP)  $\geq$  140/90 mmHg is diagnosed before pregnancy in the first 20 weeks of gestation or persists 42 days after delivery.
2. Gestational hypertension: Blood pressure  $\geq$  140/90 mmHg established after 20 weeks of gestation and not associated with proteinuria.
3. Preeclampsia-eclampsia: Hypertension, proteinuria ( $\geq$  0.3 g/24 hours), and edema after 20th week of gestation. Eclampsia is defined as the appearance of generalized convulsions associated with signs of preeclampsia, or their occurrence within 7 days of parturition, and not caused by epilepsy or other convulsive disorder.<sup>3</sup>

Antihypertensive drugs are prescribed during pregnancy to reduce the progression to severe hypertension which may lead to serious health issues for the mother as well as the fetus. Severe hypertension should be treated with antihypertensive drugs. Methyldopa and labetalol

are considered as the drug of choice whereas nifedipine is considered as the second-line therapy. Few studies have reported that drugs like ACE inhibitors and ARB'S are contraindicated during all trimesters of pregnancy due to their teratogenic and fetotoxic effect. The study of prescribing patterns is a component of the medical audit, which seeks monitoring, evaluation, and necessary modifications in prescribing practices of the prescribers to achieve rational and cost-effective medical care. For the effective treatment of hypertension the choice of drug changes at short intervals and the factors responsible for the change are efficacy, side effects both short term and long term effects on other systems, and cost, accordingly survey is needed to be conducted regarding the pattern of usage of antihypertensive drugs to analyze if the current user is rational, effective and tolerated and in concordance with the current guidelines for the treatment of hypertension.<sup>4</sup> Considering all these factors the present study was designed to assess the prescribing pattern of antihypertensive agents in pregnant women.

## METHODOLOGY

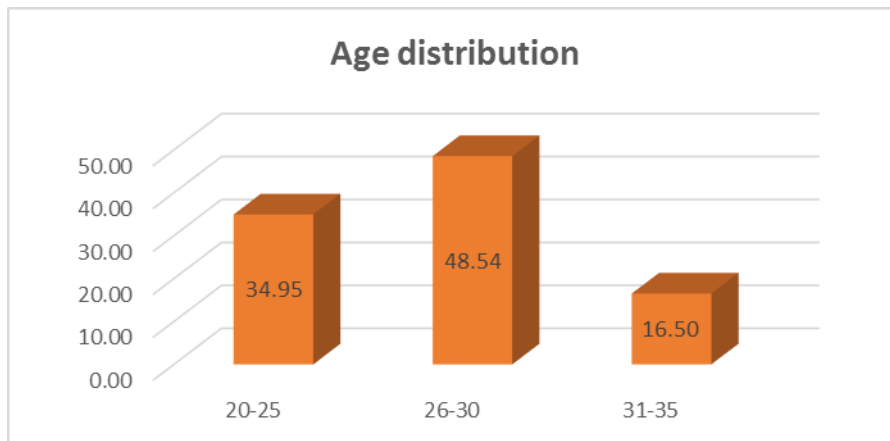
A prospective, observational study was conducted in a tertiary care teaching hospital after obtaining institutional ethical clearance. All inpatient pregnant women currently diagnosed with hypertension with or without co-morbidities in the department of gynecology and obstetrics were included in the study and Pregnant women are with mental disabilities were excluded from the study. The required details were collected in a well-designed data collection form. The details include patient demographic details, medical history, medication history, diagnosis/laboratory data, drug treatment chart. The obtained data were subjected to suitable statistics.

## RESULTS AND DISCUSSION

### DEMOGRAPHIC DETAILS:

**Table No. 1: Details of Age Distribution of Pregnant Women**

Age Distribution (years)	Number of patients	Percentage (%)
20-25	36	34.95
26-30	50	48.54
31-35	17	16.5
Total	103	100



**Figure No. 1: Details of Age Distribution of Pregnant Women**

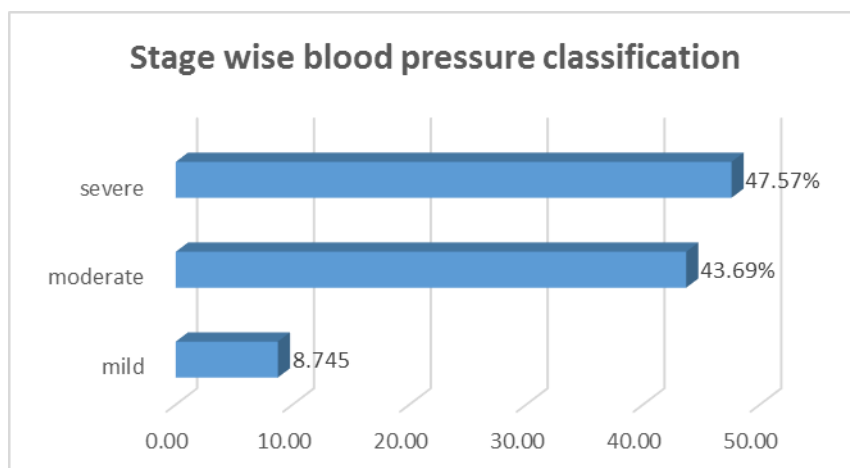
The age distribution of enrolled pregnant women in our study shows that 36 (34.95%) of pregnant women were between the age group of 20 – 25 years, 50 (48.54%) were between the age group of 26-30 years, 17 (16.5%) were between the age group of 31 – 35.

In comparison with the study conducted by S. Manjusha *et al*, conducted a prospective study over one year in inpatients of gynecology and obstetrics department at Bharati Hospital, Pune, the main maternal age was 23.8 years.<sup>5</sup>

**STAGE WISE BLOOD PRESSURE CLASSIFICATION:**

**Table No. 2: Details of Stage wise Blood Pressure Classification**

Stage	Number of patients	Percentage (%)
<b>Mild hypertension</b> (s BP 140-159/ d BP 90-99)	<b>9</b>	<b>8.74</b>
<b>Moderate hypertension</b> (160-179/100-109 mm Hg)	<b>45</b>	<b>43.69</b>
<b>Severe hypertension</b> ≥sBP160/Dbp110	<b>49</b>	<b>47.57</b>
<b>Total</b>	<b>103</b>	<b>100</b>



**Figure No. 2: Details of stage-wise blood pressure classification**

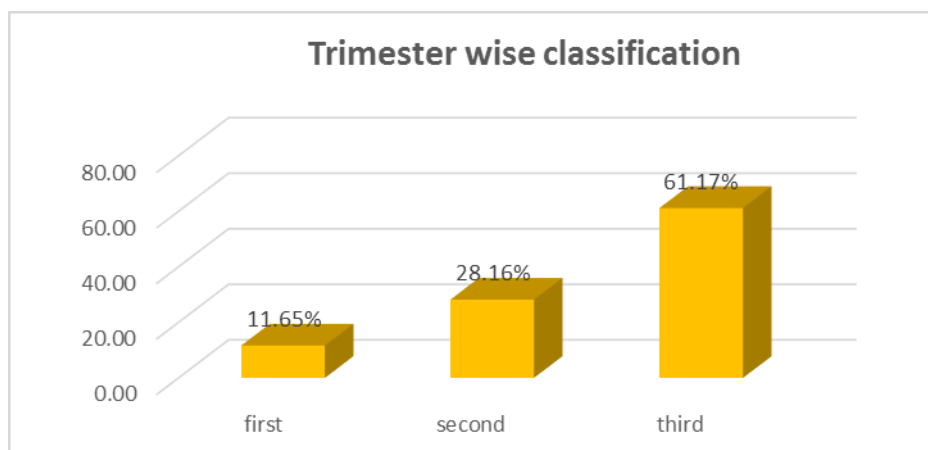
Our study showed that among 103 pregnant women 9(8.74%) were having mild hypertension, 45(43.69%) of pregnant women were having moderate hypertension and 49(47.57%) of pregnant women were having severe hypertension.

In comparison to a study conducted by S. Shreya *et al.*, a retrospective observational study in association with the department of pharmacology and department of obstetrics and gynecology at Nkp salve institute of medical science and research Centre, Lata Mangeshkar Hospital, Nagpur in which 48% and 32% of the patients were having mild and moderate hypertension and only 20% of the patients belong to severe hypertension.<sup>6</sup>

**TRIMESTER WISE CLASSIFICATION:**

**Table No. 3: Details of Trimester Wise Distribution of Pregnant Women**

Trimester	Number of Patients	Percentage (%)
First Trimester	12	11.65
Second Trimester	29	28.16
Third Trimester	63	61.17
Total	103	100



**Figure No. 3: Details of trimester wise distribution of Pregnant Women**

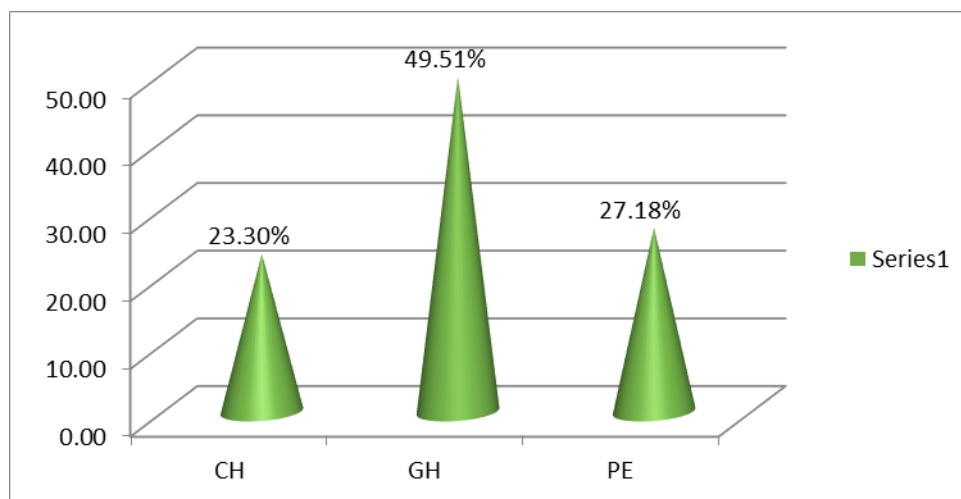
Among 103 women enrolled in the study, 12 (11.65%) women were from the first trimester, 29(28.16%) women were from the second trimester and the remaining 63(61.17%) are from the third trimester.

Our study shows that hypertension in pregnancy is more in the third trimester. A similar result was obtained in the study conducted by K.A.M *et al.*, a non-invasive cross-sectional prospective observational study in the department of obstetrics and gynecology, at RMMCH, Annamali University, Tamilnadu.<sup>7</sup>

**STAGES OF HYPERTENSIVE DISORDERS OF PREGNANCY:**

**Table No. 4: Details of stages of hypertensive disorder of pregnancy:**

Stages	Number of patients	Percentage (%)
Chronic Hypertension	24	23.3
Gestational Hypertension	51	49.51
Pre-Eclampsia	28	27.18
Total	103	100



**Figure No. 4: Details of stages of hypertensive disorders of pregnancy**

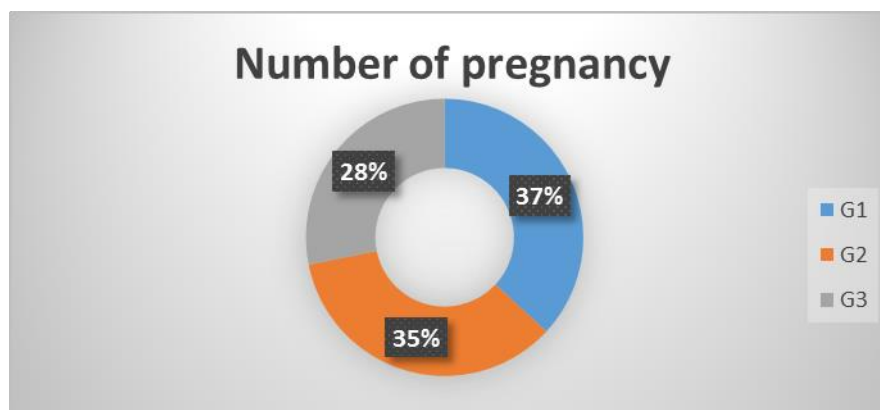
Out of the 103 pregnant women enrolled in the study with hypertension, the result revealed that 51(49.51%) patients were suffering from gestational hypertension followed by 28(27.18%) are with pre-eclampsia and 24(23.35%) patients belong to chronic hypertension.

In comparison with the study conducted by G. J. Ray *et al.*, a study on the use of antihypertensive medication in pregnancy and the risk of adverse perinatal outcomes during the study period at MC- Master University medical center in which 44.4% had gestational hypertension, 25.7% isolated preeclampsia, and 6.4% had chronic hypertension with superimposed preeclampsia.<sup>8</sup>

**NUMBER OF PREGNANCIES:**

**Table No. 5: Details of Number of Pregnancy**

Number of pregnancies	Number of patients	Percentage (%)
Primigravidae (G1)	38	36.89
Gravida 2 (G2)	36	34.95
Gravida 3 (G3)	29	28.16
Total	103	100



**Figure No. 5: Details of Number of Pregnancy**

Among 103 pregnant women enrolled in the study, 38(36.89%) women were not having any children, 36(34.93%) women had one child and 29(28.16%) women were having two children.

In compare to the study conducted by K.A.M *et al.*, a non-invasive cross-sectional prospective observational study in the department of obstetrics and gynecology, at RMMCH, Annamalai University, Tamil Nadu in which the incidence of pre-eclampsia is more in primigravida (49 %) and the third trimester (52.7%) of pregnancy.<sup>7</sup>

**TREATMENT:**

**Table No. 6: Details of the approach of treatment of hypertension**

Therapy	Number of patients	Percentage (%)
Monotherapy	52	50.49
Two drug therapy	51	49.51
Total	103	100





**Figure No. 6: Details of the approach of treatment of hypertension**

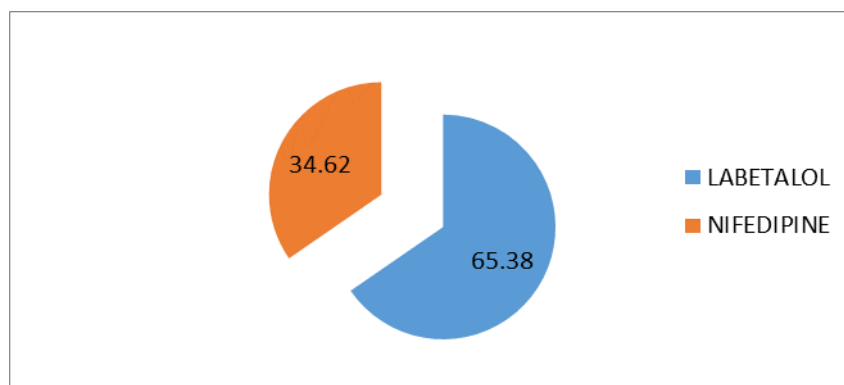
Our study result showed that a greater number of patients were treated with monotherapy 52(50.49%) followed by two drug therapy 51(49.51).

In comparison to a study conducted by K. T. Naveen, N. A. Tadvi, R. Kaul., a retrospective observational study in collaboration by the department of pharmacology with the department of obstetrics in Kamineni institute of medical science, Narketpally in which Single drug therapy was prescribed in 46.94% patients.<sup>1</sup>

**MONOTHERAPY- DRUG WISE:**

**Table No. 7: Details of Different Drugs Used in Monotherapy**

Drugs	Number of Patients	Percentage (%)
Labetalol	34	65.38
Nifedipine	18	34.62
Total	52	100



**Figure No. 7: Details of Different Drugs used in Monotherapy**

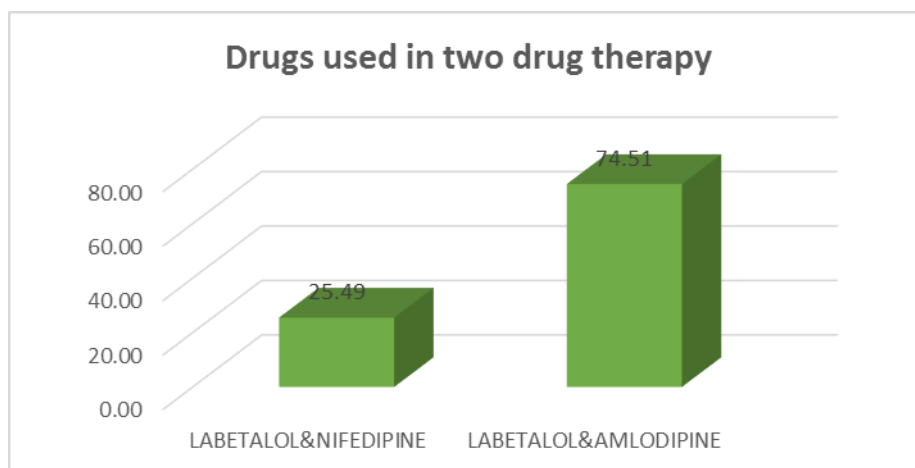
In our study, the result revealed that, out of 52 patients prescribed with monotherapy, 34(65.38%) patients were prescribed with Labetalol, and 18(34.62%) patients were prescribed with Nifedipine.

In comparison to the study conducted by D. Tirthankar, G. Abhishek, B. Banasree, A retrospective observational study in collaboration with the department of pharmacology and the department of obstetrics and gynecology at the college of medicine and JNM, west Bengal to perform the drug utilization study in pregnancy-induced hypertension in a tertiary care teaching hospital. Out of the total prescription studied methyldopa was the commonly prescribed antihypertensive followed by labetalol, other drugs prescribed include nifedipine, amlodipine, and magnesium sulfate.<sup>9</sup>

### **TWO DRUG THERAPIES –DRUG WISE:**

**Table No. 8: Details of Different Drugs Used in Two Drug Therapy**

Drugs	Number of Patients	Percentage (%)
Labetalol and Nifedipine	38	74.51
Labetalol and Amlodipine	13	25.49
Total	51	100



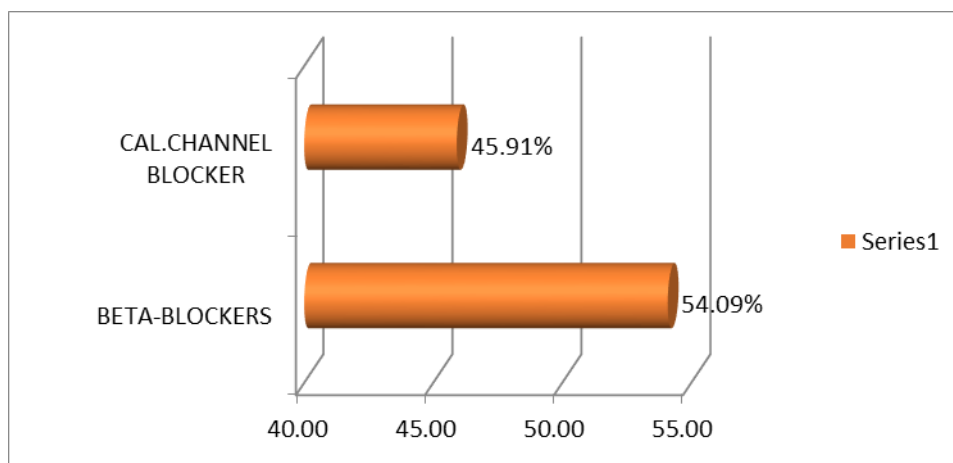
**Figure No. 8: Details of different drugs used in two drug therapy**

Further analysis of the prescribing patterns of different drugs used under two drug therapies is shown in the table below. The result revealed that, out of 51 patients, 13(25.49%) were prescribed Labetalol and Amlodipine, 38 (74.51%) patients were prescribed Labetalol and Nifedipine.

**CLASS WISE DISTRIBUTION OF ANTIHYPERTENSIVE DRUGS:**

**Table No. 9: Details of Class wise Distribution of Antihypertensive Drugs**

Drugs Class wise	Number of drugs given to patients	Percentage (%)
Beta-blockers	86	54.09
Calcium channel blockers	73	45.91
Total	159	100



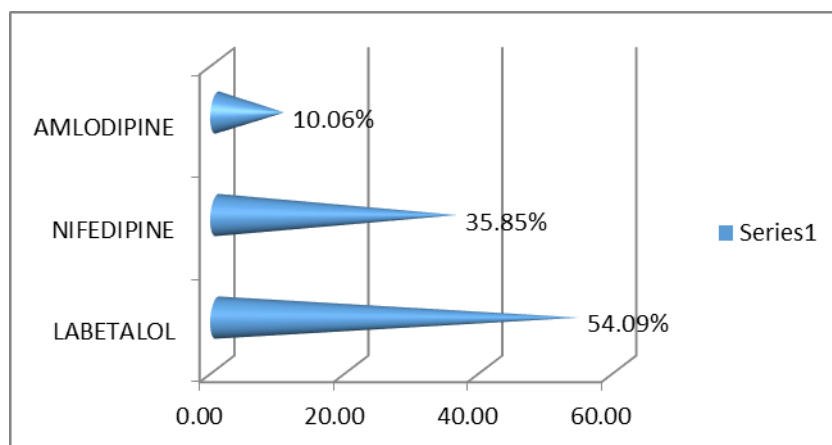
**Figure No. 9: Details of the class-wise distribution of antihypertensive drugs**

To analyze the most commonly prescribed class of antihypertensive drugs, the class-wise distribution of the antihypertensive drug is shown in the table above. The result revealed that 86 (54.09%) of drugs prescribed were beta-blockers (in both monotherapy and two drug therapy) followed by 73 (45.91%) of drugs prescribed were calcium channel blockers (in both monotherapy and two drug therapy).

### DRUG WISE DISTRIBUTION OF ANTIHYPERTENSIVE DRUGS

**Table No. 10: Details of Drug Wise Distribution of Antihypertensive Drugs**

Drugs	Number of drugs given to patients	Percentage (%)
Labetalol	86	54.09
Nifedipine	57	35.85
Amlodipine	16	10.06
Total	159	100



**Figure No. 10: Details of drug wise distribution of antihypertensive drugs**

Our study result revealed that the most commonly prescribed antihypertensive is Labetalol 86(54.09) followed by Nifedipine 57(35.85%) followed by Amlodipine 16 (10.06%).

In comparison to the study conducted by D. Tirthankar, G. Abhishek, B. Banasree, A retrospective observational study in collaboration with the department of pharmacology and the department of obstetrics and gynecology at college of medicine and JNM, west Bengal. Out of the total prescription studied methyldopa was the commonly prescribed antihypertensive followed by labetalol, other drugs prescribed include nifedipine, amlodipine, and magnesium sulfate.<sup>9</sup>

## CONCLUSION

The present study concludes that the majority of the drug prescribed belongs to the class beta-blockers followed by Calcium-Channel Blockers. Labetalol was the commonest prescribed Antihypertensive in monotherapy and two-drug therapy. All the prescribed Antihypertensive drugs in the present study belong to category C, none of the prescribed drugs were from teratogenic categories D and X. The present study also concludes that antihypertensive agents were rationally prescribed.

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