

# Antihypertensives in Preeclampsia – A Retrospective Analysis

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**Abstract:** *Hypertensive disorders constitute one of the most common medical complication in pregnancy. It is associated with significant maternal and perinatal morbidity and mortality. In this study, we analysed 104 cases of preeclampsia who were admitted to our hospital and treated with common antihypertensive drugs used in pregnancy, either singly or in combination. After initiation of treatment, there was a fall in both systolic and diastolic blood pressure which was statistically significant. The antihypertensives used were mainly methyldopa and nifedipine combination. There was no serious adverse effect on combining the two drugs. Antihypertensives helped in prolonging pregnancy and also decreased the maternal and perinatal morbidity.*

**Keywords:** Preeclampsia, blood pressure, methyldopa, nifedipine, side effects, morbidity

## 1. Introduction

Hypertensive disorders are one of the common medical complication occurring during pregnancy. Is associated with significant maternal and perinatal morbidity and mortality.<sup>1</sup> The exact etiology is not known, but vasospasm and endothelial damage is the main pathology. Though delivery is the most appropriate therapy for the mother, is not ideal for the fetus remote from term. Antihypertensive treatment will reduce the maternal complications and help in prolonging pregnancy to enable fetal maturity.<sup>2</sup> Various antihypertensive drugs are being used in the treatment of Preeclampsia to control blood pressure, but there is no set protocol for therapy.<sup>3</sup>

## 2. Objectives

The objective was to analyse the effectiveness of methyl dopa and nifedipine in the treatment of preeclampsia. Also to analyse the maternal and perinatal outcome, maximum dose of the drugs used to reduce the blood pressure and adverse effect of the drugs.

## 3. Materials and Methods

One hundred and four cases (104 cases) of Preeclampsia who were admitted to M.S.Ramaiah hospital from 01/04/2013 to 31/03/2014 were analysed. Preeclampsia was the diagnosis when the gestational age was > 20 weeks and blood pressure of > 140/90 mmHg on more than two occasions with persistent proteinuria 30mg/dl (1+ dipstick) in urine sample. All patients irrespective of parity and age were studied.

### Exclusion Criteria

- 1) History of chronic hypertension, diabetes mellitus, chronic renal disease.
- 2) Proven Antiphospholipid antibody syndrome, thrombophilias and connective tissue disorders.
- 3) Patients who came with complications of preeclampsia were excluded as delivery was planned.

### Statistical Analysis

The results were averaged (mean+ standard deviation) for each continuous parameter and categorical variable were expressed as percentage and number presented in tables and figures.

### Method of collection of data

A total of 104 cases of Preeclampsia over a period of one year were analysed. The antihypertensive drugs used were mainly Methyldopa and Nifedipine. About 2.8% of the patients were referred after starting the drug Labetalol and were continued with the same drug.

The obstetric history, clinical examination, blood pressure were analysed.

Investigation reports included complete blood count, coagulation profile, renal function tests, liver function tests, urine routine, 24 hour urine protein, fundoscopy, non stress test, obstetric scan and Doppler.

The patients in the methyldopa group had received 250-2000 mg in 2-4 divided doses per day and the patients in the nifedipine group had received the drug 10-60mg per day. Brachial artery blood pressure was checked with the patient in lateral recumbent position using calibrated mercury sphygmomanometer with appropriate cuff size. Korotkoff V was used to determine diastolic blood pressure.

The blood pressure was monitored at 0, 6, 12, 24, 48, 72 hours and 24, 48 hrs post delivery and 2 weeks in the postnatal period.

The initial dosage, the maximum dose required was observed, side effects if any were noted.

The maternal outcome including complications, mode of delivery, the fetal outcome like prematurity, still birth, neonatal death, need for NICU were analysed.

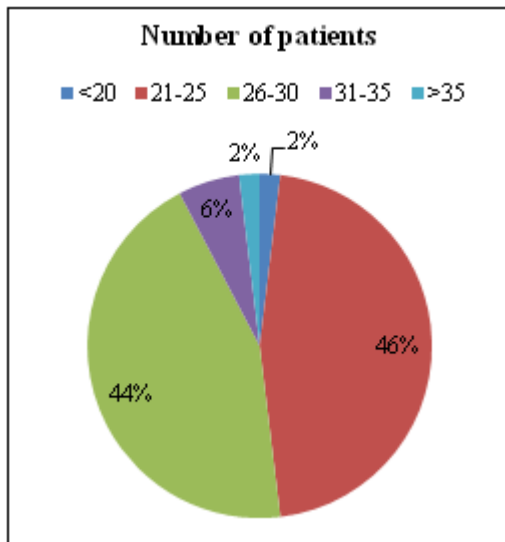
Follow up upto two weeks were observed.

#### 4. Observations and Results

Data obtained was analyzed using SPSS software 7 and results studied. P value is defined as significant when <0.05

**Table 1:** Age distribution

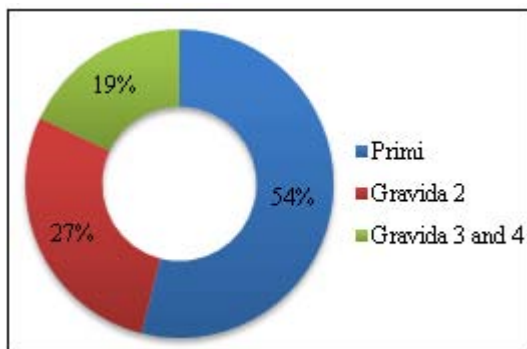
Age in years	Number of patients	Percentage
<20	2	1.9
21-25	48	46.1
26-30	46	44.2
31-35	6	5.7
>35	2	1.9



Among the study population, the age range was between 18-38 years, but majority were between 21-30 years. 90% were between 21-30 years.

**Table 2:** Distribution of Parity

Gravida	Number of patients	(%)
Primi	56	53.8
Gravida 2	28	26.9
Gravida 3 and 4	20	19.2

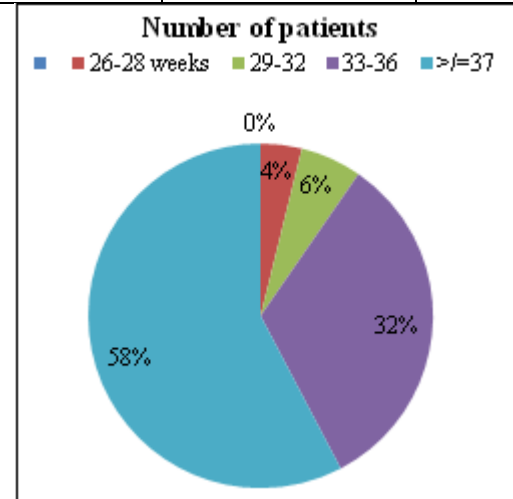


In the study population, primigravida constituted 53.8%, followed by second gravida 26.9 %

**Table 3:** Distribution according to gestational age

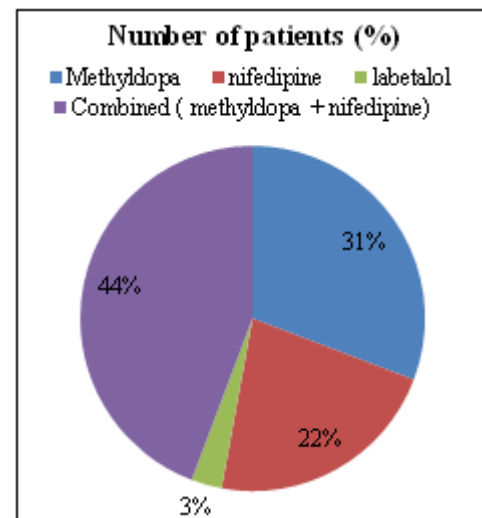
Gestational age	Number of patients	Percentage
26-28 weeks	04	3.8
29-32	6	5.7

33-36	34	32.6
>=37	60	57.6



**Table 4:** Types of antihypertensives used

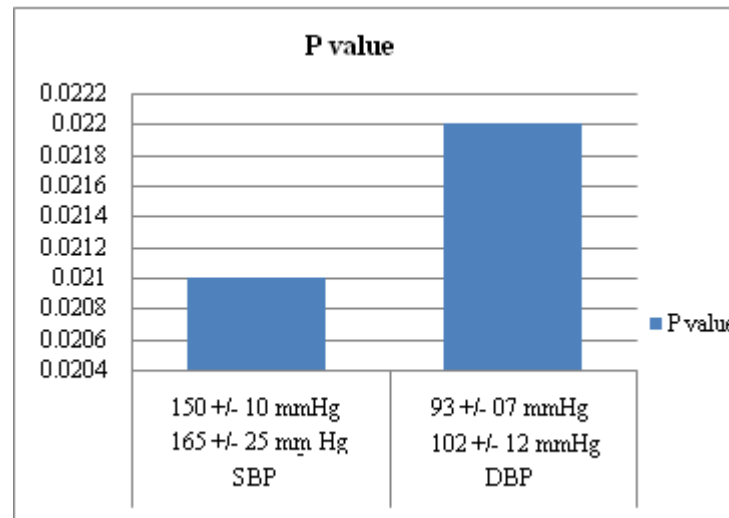
Antihypertensive drug	Number of patients	%
Methyldopa	32	30.7
Nifedipine	23	22.1
Labetalol	03	2.8
Combined ( methyldopa + nifedipine)	46	44.2



The antihypertensive drugs used were methyldopa and nifedipine. In spite of the maximum dosage of one of the drugs and blood pressure was not controlled , a second drug was added.

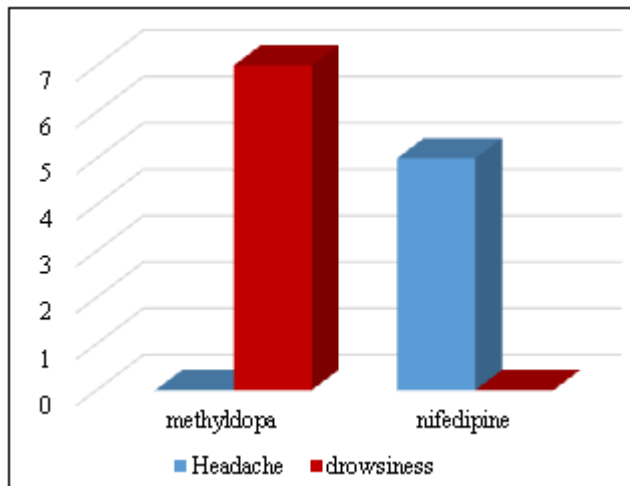
**Table 5:** Pre and post treatment blood pressure values

Blood pressure	Before treatment	After treatment	P value
SBP	165 +/- 25 mm Hg	150 +/- 10 mmHg	0.021
DBP	102 +/- 12 mmHg	93 +/- 07 mmHg	0.022



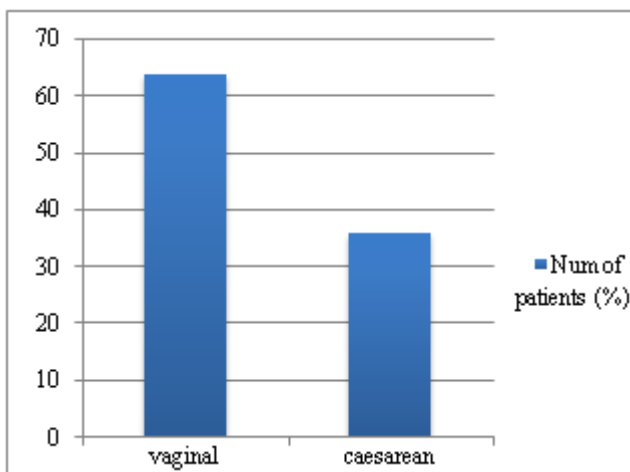
**Table 6:** Side effects of drugs

Side effect	Methyldopa	%	Nifedipine	%
Headache	0		5	21.7%
Drowsiness	7	21.8%	0	



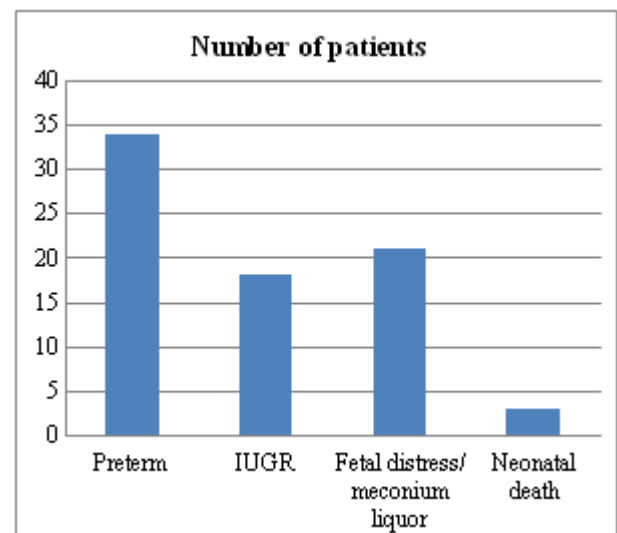
**Table 7:** Mode of delivery

Mode of delivery	Number of patients	(%)
Vaginal	68	65.3
Caesarean	36	34.6



**Table 8:** Need for NICU Admission and neonatal outcome

Cause	Number of patients	(%)
Preterm	34	32.6
IUGR	18	17.3
Fetal distress/ meconium liquor	21	20.1
Neonatal death	03	2.8



## 5. Discussion

Preeclampsia is one of the most dreaded condition in pregnancy which threatens the health of the mother and fetus. Hypertensive disorders continue to affect women globally, complicating 5-20% of pregnancies.

The aim of antihypertensive therapy in the management of pregnancy induced hypertension is to prevent complications while prolonging the course of pregnancy<sup>5</sup>. The most commonly used antihypertensive drugs in pregnancy are nifedipine, methyldopa, labetalol and hydralazine<sup>8</sup>. Most of these drugs are quiet safe for mother and foetus<sup>9,10</sup>. The aim of antihypertensive therapy is to achieve a blood pressure lower than 170/110 mm of Hg but not lower than 130/90 mm of Hg without compromising uteroplacental blood flow and placental perfusion<sup>11</sup>.

Methyldopa has been available for many years and is widely used. Current literature supports the safety and efficacy of nifedipine in the treatment of preeclampsia.

104 patients were analysed. They received either Nifedipine or Methyldopa and when the blood pressure was not controlled, combination was used. Maternal and fetal outcome were analysed.

Fall of > 20 mm of Hg in the mean blood pressure at 24 hours after initiation of treatment was observed which was clinically and statistically significant. Bharathi KN et al showed both systolic and diastolic blood pressures were controlled significantly in both groups at end of 24 hours with  $p < 0.01$ .

In a study by Ganeshan et al the mean diastolic pressure was significantly reduced in Nifedipine group with  $p$  value < 0.0001.

In our study none of the patients developed complications like eclampsia, abruption. When side effects were analysed it was observed that headache was the most common side effect in Nifedipine group and drowsiness was observed in Methyldopa group. The need for additional antihypertensive drugs was seen in 44.2 % of the patients. The maximum dose of Nifedipine was 60 mg at which optimal blood pressure control was obtained. The maximal Methyldopa dose was 2000mg at which blood pressure control was obtained.

The fetal outcome in terms of NICU admission was mainly for prematurity and Intrauterine growth restriction.

Hence this study brings into light the effectiveness of both Methyldopa and Nifedipine in the management of preeclampsia.

## 6. Conclusion

The incidence of preeclampsia was common in the younger age group < 30 years. The Fall of > 20 mm of Hg in the blood pressure at 24 hours after initiation of treatment was observed which was clinically and statistically significant.

No adverse events were noted with the use of these drugs though headache was seen in Nifedipine group and drowsiness in Methyldopa group. Fetal complications such as prematurity and intrauterine growth restriction were the reasons for NICU admission.

No major maternal complications was observed. Nifedipine is as effective as Methyldopa in the treatment of PIH.<sup>3</sup> Among the antihypertensives used, methyldopa with nifedipine combination cause marked decrease in the systolic and diastolic blood pressure with reduced maternal and neonatal complications.<sup>13</sup>

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