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Original Research

A comparative study of labetalol and nifedipine in the management of hypertensive disorders of pregnancy

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ABSTRACT:
Background: Hypertensive disorders of pregnancy are one of the major causes of morbidity and mortality in both the mother and fetus. The present study was conducted to compare labetalol and nifedipine in the management of hypertensive disorders during pregnancy. **Materials & Methods:** 72 pregnant women with hypertension were divided into two groups. Group I received labetalol and group II received nifedipine. Oral Labetalol was initiallystarted at a dose of 100 mg twice daily (BD) and a maximum dose of 200 mg thrice daily (TDS) was given. Nifedipine was initially started with a dose of 10 mg BD and titrated upwards to 20 mg TDS. Pregnant subjects were monitored daily for blood pressure and fetal well-being. **Results:** Group I received 100 mg labetalol and group II received 10 mg Nifedipine. Gravida I patients was noted to have 62% and 60%, Gravida 2, 24% and 27%, and Gravida 3 14% and 13% reduction in group I and group II respectively. The difference was significant (P< 0.05). SBP (mm Hg) before treatment was 153.4 and 152.4 and after treatment was 126.8 and 138.2 in group I and group II respectively. DBP (mm Hg) before treatment was 104.2 and 106.4and after treatment was 90.5 and 99.2. MAP (mm Hg) before treatment was 120.2 and 122.6 and after treatment was 101.5 and 112.8 in group I and group II respectively. The difference was significant (P< 0.05). **Conclusion:** Labetalol is a better antihypertensive than nifedipine in controlling maternal hypertension and fetal outcome. This difference was also remarkable in the parity as shown in the chart comparing Gravida 1, 2 & 3.
Keywords: Labetalol,Nifedipine, Hypertension, Pregnancy

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INTRODUCTION

Hypertensive disorders during pregnancy can negatively impact both the mother and fetus and if not controlled, can often lead to an increased risk of morbidity and mortality affecting about 5-10% of all pregnancies.[1] The prevalence of chronic hypertension in pregnancy is estimated at 3%, but this number is set to increase with rising maternal age and the global obesity epidemic. Given that chronic hypertension is associated with significantly increased adverse maternal and perinatal outcomes compared with the general pregnant population, defining optimal antihypertensive treatment(s) is warranted.[2] Hypertensive disorders of pregnancy include preeclampsia, eclampsia, gestational hypertension, chronic hypertension, and preeclampsia superimposed on chronic hypertension. Among hypertensive disorders, preeclampsia and eclampsia are the major causes of maternal and perinatal morbidity and mortality.[3,4]

In one study, results showed that tighter control of diastolic blood pressure with a target of 85 mm Hg (compared with less-tight control to a diastolic target of 105 mm Hg) did not increase the risk of pregnancy loss or high-level neonatal care in women with non-severe chronic and gestational hypertension, no proteinuria, and singleton pregnancy.[5] Overall, beta-blockers, specifically labetalol, were just as effective as other antihypertensives used during pregnancy and do not appear to be teratogenic based on current data. The present study was conducted to compare labetalol and nifedipine in the management of hypertensive disordersof pregnancy.

MATERIALS & METHODS

The present study comprised 72 pregnant women with hypertension whose two blood pressure recordings are ≥ 140/90 mm Hg more than 6 hours apart. The consent was obtained from all enrolled patients.

Data such as name, age, etc. were recorded. They were divided into two groups with each group having 36 subjects Group I received labetalol and group II received nifedipine. Labetalol was started at an initial dose of 100 mg twice daily (BD) and a maximum dose of 200 mg thrice daily (TDS) was given. Nifedipine was started with an initial dose of 10 mgBD and the dose was increased up to 20 mg TDS. Patients were monitored daily for blood pressure and fetal well-being. Data were analyzed with a P value < 0.05 considered significant.

RESULTS

Table I Distribution of patients

Groups	Group I	Group II
Drug	100 mg labetalol	10 mg Nifedipine
Number	36	36

Table I shows that group I received 100 mg labetalol and group II received 10 mg Nifedipine.

Table II Comparison of gravida

Gravida	Group I	Group II	P value
1	62%	60%	0.05
2	24%	27%	
3	14%	13%	

Table II, graph I shows that gravida I was seen in 62% and 2 in 60%, 2 in 24% and 27% and 3 in 14% 13% in group I and group II respectively. The difference was significant (P< 0.05).

Graph I Comparison of gravida

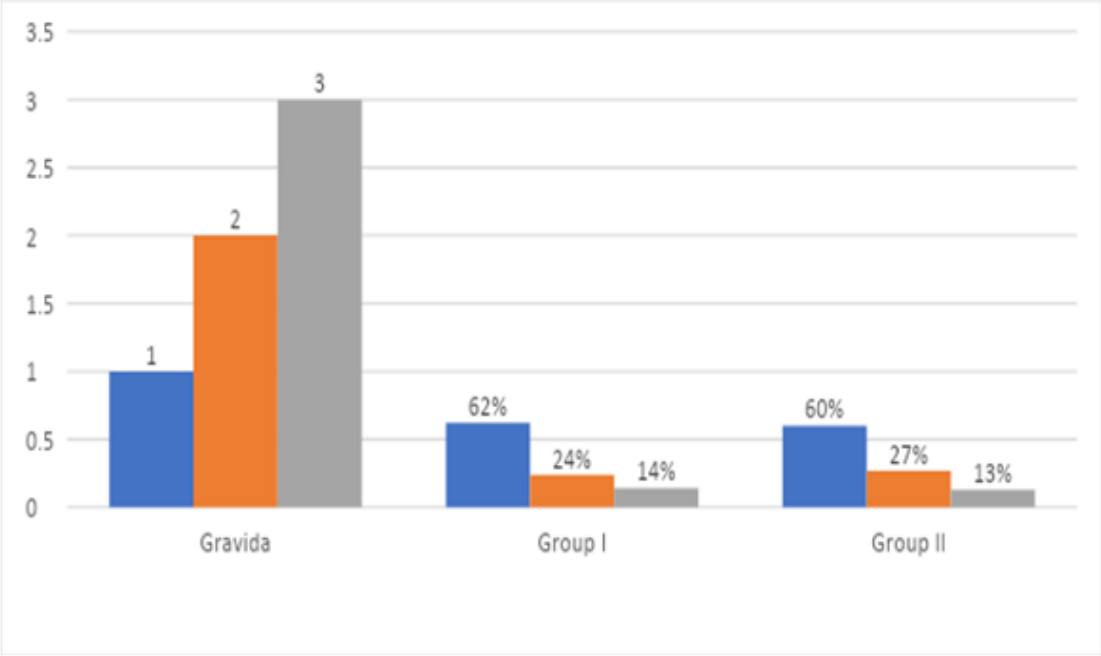


Table III Comparison of parameters

Parameters	Variables	Group I	Group II	P value
SBP (mmHg)	Before treatment	153.4	152.4	0.05
	After treatment	126.8	138.2	
DBP	Before treatment	104.2	106.4	0.12

(mmHg)	After treatment	90.5	99.2	
MAP (mmHg)	Before treatment	120.2	122.6	0.17
	After treatment	101.5	112.8	

Table III, graph I shows that SBP (mm Hg) before treatment was 153.4 and 152.4 and after treatment was 126.8 and 138.2 in group I and group II respectively. DBP (mm Hg) before treatment was 104.2 and 106.4 and after treatment was 90.5 and 99.2. MAP (mm Hg) before treatment was 120.2 and 122.6 and after treatment was 101.5 and 112.8 in group I and group II respectively. The difference was significant (P< 0.05).

Graph I Comparison of parameters

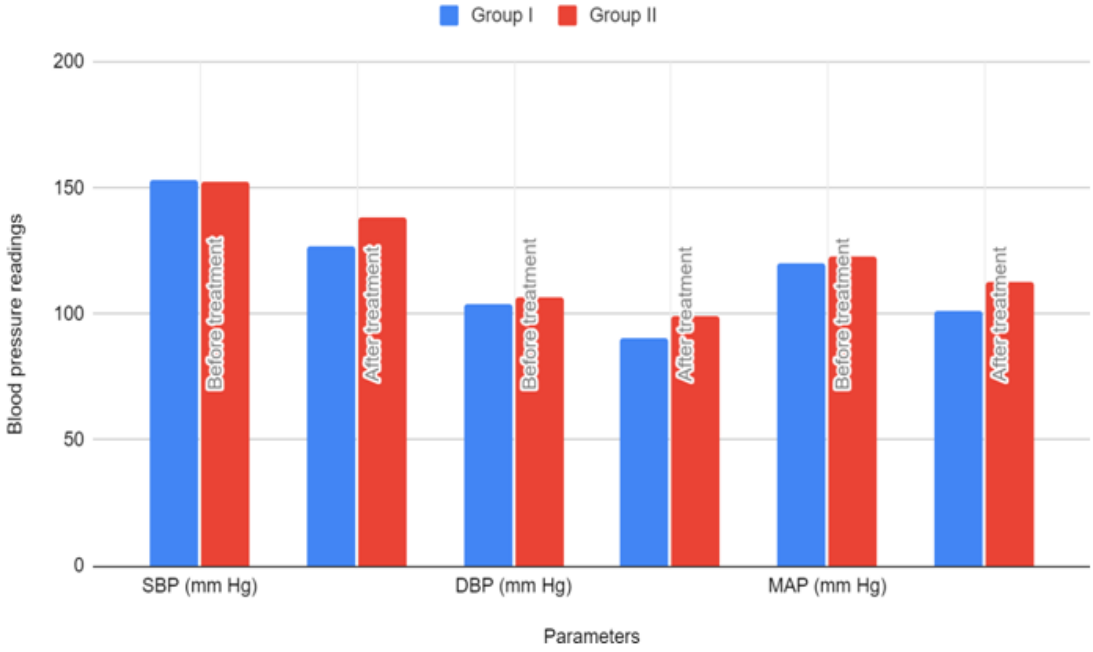
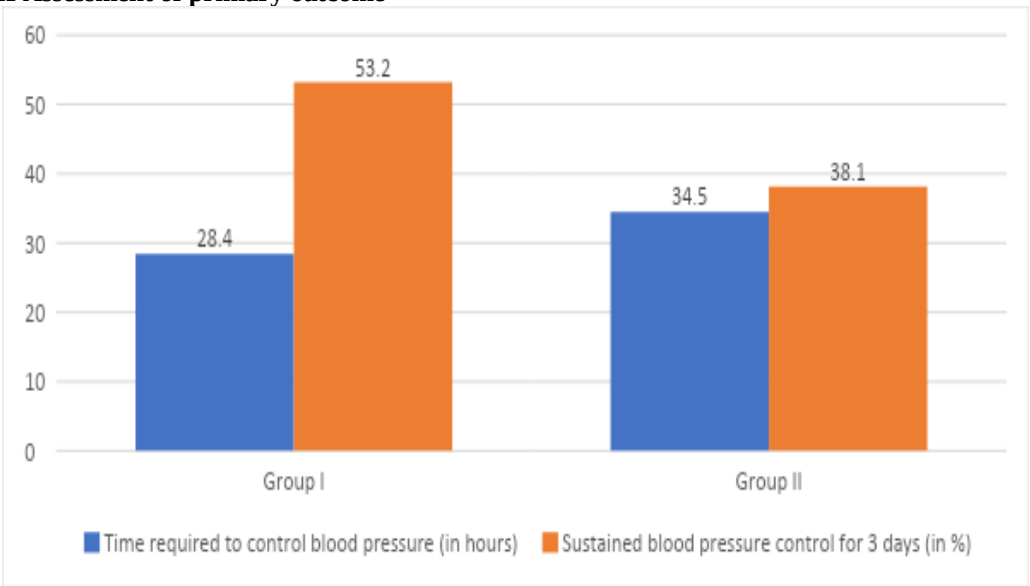


Table III Assessment of primary outcome

Variables	Group I	Group II	P value
Time required to control blood pressure (in hours)	28.4	34.5	0.05
Sustained blood pressure control for 3 days (in %)	53.2	38.1	0.01

Table III, graph II shows that mean time required to control blood pressure (in hours) was 28.4 in group I and 34.5 in group II and sustained blood pressure control for 3 days (in %)was 53.2% in group I and 38.1% in group II. The difference was significant (P< 0.05).

Graph II Assessment of primary outcome



DISCUSSION

Hypertensive disorders are the most common medical disorders during pregnancy and are a major cause of maternal and perinatal mortality and morbidity worldwide.[7] The reported rate of hypertension in pregnancy is 6 %. Hypertension in pregnancy is a special conditionbecause the duration of therapy is shorter, the benefits to the mother may not be obvious during the short time of treatment and the exposure to drugs regards both mother and fetus.[8] Even if delivery is the only treatment and it leads to the disappearance of the disease, this is usually problematic below 28 weeks of gestation when the baby can be expected to be extremely immature. We found that group I received 100 mg labetalol and group II received 10 mg Nifedipine. We found that gravida I was seen in 62% and 2 in 60%, 2 in 24% and27%, and 3 in 14% and 13% in group I and group II respectively. Giannubilo SR et al[10] assessed the maternal and fetal outcomes of pregnancies affected by hypertensive disorders treated with nifedipine versus labetalol. The patients were divided into four groups: gestational hypertension (113 patients); mild preeclampsia (77 patients); severe preeclampsia (31 patients); HELLP syndrome (21 patients). They found that there was a higher rate of intrauterine growth restriction infants among women treated with labetalol compared with those treated with nifedipine (38.8 vs. 15.5 %; $p<0.05$), but only in the subgroup of women affected by Gestational Hypertension and Mild Preeclampsia. In this group was also higher the rate of fetal worsening assessed by fetal heart rate tracing (33.3 vs. 14.2 %; $p<0.05$). No neonatal malformations and no differences in the rate of adverse side effects were observed.

We observed that the mean time required to control blood pressure (in hours) was 28.4 in group I and 34.5 in group II and sustained blood pressure control for 3 days (in %) was53.2% in group I and 38.1% in group II. Deshmukh et al[11] compared the efficacy and safety of oral labetalol and nifedipine in the hypertensive disorder of pregnancy. This study included 60 antenatal women irrespective of parity and gestational age from 20-40 weeks with the hypertensive disorder. Chronic hypertension, diabetes, cardiac, renal disease, hemophilia, and bronchial asthma were excluded from the study. The efficacy of labetalol and nifedipine were compared. Results: In this study fall in systolic blood pressure (SBP), diastolic blood pressure (DBP), and mean arterial pressure (MAP) in the labetalol group was statistically significant when compared to nifedipine. The outcome of the fetus was also better with the use of oral labetalol.

Webster et al12 included 112 women (98%) who completed the study (labetalol n=55, nifedipine n=57). Maximum blood pressure after randomization was 161/101 mmHg with labetalol versus 163/105 mmHg with nifedipine (mean difference systolic: 1.2 mmHg [−4.9 to 7.2 mmHg], diastolic: 3.3 mmHg [−0.6 to 7.3 mmHg]). Mean blood pressure was 134/84 mmHg with labetalol and 134/85 mmHg with nifedipine (mean difference systolic: 0.3 mmHg [−2.8 to 3.4 mmHg], and diastolic: −1.9 mmHg [−4.1 to 0.3 mmHg]). Nifedipine use was associated with a 7.4-mmHg reduction (−14.4 to −0.4 mmHg) in central aortic pressure, measured by pulse wave analysis. No difference in treatment effect was observed in black women (n=63), but a mean 4 mmHg reduction (−6.6 to −0.8 mmHg; P=0.015) in brachial diastolic blood pressure was observed with labetalol compared with nifedipine in non-black women (n=49). Labetalol and nifedipine control mean blood pressure target in pregnant women with chronic hypertension

CONCLUSION

Authors found that labetalol is a better antihypertensive than nifedipine in terms of control ofhypertension and fetal outcome.

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