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# PREGNANCY OUTCOMES OF NIFEDIPINE COMPARED WITH LABETALOL FOR ORAL TREATMENT OF MILD CHRONIC HYPERTENSION

**Atyya Bibi Khan[1], Shandana Mustafa Jadoon[2*], Ayat Ul Burr[3], Sumaira Fareed[4], Hajra Amjad[5], Nasima Tayyab[6]**

[1]Assistant Professor Gynae C Ward, Ayub Medical College, Abbottabad
[2*]Associate Professor, Ayub Teaching Hospital, Abbottabad
[3,4,5,6]PGR Gynae C Ward, Ayub Medical College, Abbottabad

***Corresponding Author:** Shandana Mustafa Jadoon
*E mail : shandana86@gmail.com

## ABSTRACT

**Background:** Chronic hypertension during pregnancy poses significant risks to both maternal and fetal health, with complications such as preeclampsia, preterm birth, and intrauterine growth restriction (IUGR). Nifedipine and Labetalol are widely used antihypertensive drugs during pregnancy, but their comparative effects on mild chronic hypertension remain under-researched, especially in resource-constrained settings like Pakistan.

**Objective:** The study aimed to compare the maternal and fetal outcomes of pregnant women with mild chronic hypertension treated with Nifedipine versus Labetalol at Ayub Teaching Hospital Abbottabad focusing on the efficacy in controlling blood pressure and assessing related pregnancy complications.

**Methods:** This retrospective cohort study included 200 pregnant women with mild chronic hypertension, divided into two groups: 100 treated with Nifedipine and 100 with Labetalol. Data were collected from hospital records, including blood pressure readings, incidence of preeclampsia, preterm delivery rates, neonatal intensive care unit (NICU) admissions, and birth weight. Statistical analyses, including t-tests, Chi-square tests, and multivariate logistic regression, were conducted to compare outcomes.

**Results:** Nifedipine resulted in a significantly greater reduction in systolic blood pressure (20 mm Hg vs. 18 mm Hg, $p = 0.012$). The incidence of preeclampsia was lower in the Nifedipine group (8%) compared to the Labetalol group (12%), though not statistically significant ($p = 0.24$). Similarly, NICU admissions were lower in the Nifedipine group (12% vs. 20%), but the difference was not significant ($p = 0.19$). Preterm delivery rates and birth weight differences were also not statistically significant.

**Conclusion:** Both Nifedipine and Labetalol are effective in managing mild chronic hypertension during pregnancy. However, Nifedipine may offer slightly better blood pressure control and improved neonatal outcomes. Further studies with larger sample sizes are recommended to confirm these findings.

**Keywords:** Chronic hypertension, pregnancy, Nifedipine, Labetalol, blood pressure control, preeclampsia, preterm delivery, NICU admissions, maternal outcomes, fetal outcomes.

## Introduction

Chronic hypertension is high blood pressure of 140/90 mm Hg or more that occurs before pregnancy or before 20 weeks of pregnancy and is a serious complication of pregnancy with a global prevalence of between 1 and 5% (Sibai et al., 2007). This condition behooves serious health risks to both the mother and fetus, which are preeclampsia, placental abruption, preterm delivery, IUGR and higher rates of C-section (August &Sibai, 2017). Managing chronic hypertension in pregnancy is difficult to manage primarily because the option of management has to be selective between the life of the mother and the fetus. Out of all antihypertensive drugs used during pregnancy, Nifedipine and Labetalol have been classified as first-line medications thanks to their effectiveness and relatively few side effects (Magee et al., 2014).

Preeclampsia and chronic hypertension during pregnancy have been well established in the literature as a hazard to maternal and fetal survival. Expectedly, women with chronic hypertension are at an increased risk of superimposed preeclampsia, which worsen the morbidity and mortality of the mother (Brown et al., 2018). Also, hypertensive disorders of pregnancy that affect the fetus include low birth weight, preterm birth, and NICU admission (Zhang et al., 2019). Due to these risks, there is a need to establish safe, demonstrated antihypertensive treatments for its management during pregnancy without harming the unborn baby.

The drugs used in the pharmacological treatment of chronic hypertension in pregnancy include agents whose efficacy and effects on the pregnancy and fetus are well understood. The objective of therapy is to ensure that maternal blood pressure is not compromised in any way while at the same time not affecting the fetal development and growth. The drugs used most often to help control high blood pressure include Nifedipine with Calcium Channel Blockers and Labetalol with both Alpha and Beta Adrenergic Blocker.

Nifedipine functions through the prevention of movement of calcium ions into the smooth muscles surrounding blood vessels leading to decrease in vascular resistance and blood pressure (Podymow& August, 2012). It has been applied in the case of all forms of hypertension in pregnancy including Chronic Hypertension and Pre-eclampsia. Prior research has confirmed that Nifedipine yields good blood pressure control in pregnancy and has been reported to have low risks of fetal complications (Abalos et al., 2014).

While Labetalol competes with both the alpha and the beta adrenergic receptors to produce vasodilation and decreased cardiac output (Roberge et al 2017). It has been used as the main treatment for hypertensive emergencies during pregnancy because of this fast onset. The efficacy of Labetalol to be used as an antihypertensive drug in pregnant women with chronic hypertension has been established in several previous papers, comparable to that of Nifedipine (Henderson et al., 2019).

While both Nifedipine and Labetalol are commonly prescribed antihypertensive agents in pregnancy, few studies compare the two agents in the management of mild chronic hypertension during pregnancy. It is crucial to identify the disparities between these medications concerning maternal and fetal results in order to make clinical decisions and improve pregnancy outcomes.

A number of comparative case control studies have been done comparing the safety and efficacy of using Nifedipine and Labetalol in hypertensive pregnant women, but many of them have been done in women with severe hypertension or preeclampsia but not mild chronic hypertension. For instance, Raheem et al (2012) executed a randomized controlled trial to compare the effectiveness of the two drugs in treating severe hypertension, and those two drugs were shown to have similar effectiveness without adverse effects on the mother or the baby. In the same way, Vigil-De Gracia et al. (2013) observed that both Nifedipine and Labetalol lowered blood pressure in women with preeclampsia but with a somewhat more rapid decrease of BP in recipients of Labetalol.

On safety, both drugs are recognized as being safe with very little teratogenic effects and are therefore safe to be prescribed for pregnant women (Magee et al., 2014). Nevertheless, issue arises about the effects they have on fetal development and preterm labor. Labetalol is said to increase the risk of fetal

IUGR more than Nifedipine, although not so much evidence was established on this matter (Seely et al., 2019). However, in the use of Nifedipine, there are fewer maternal side effects such as fatigue and dizziness as compared to Labetalol (Von Dadelszen,et al, 2015).
Since there may be differences between maternal tolerance and fetal outcomes, a comparison between the two in the setting of mild chronic hypertension is appropriate. Therefore, this study will fill this research gap by comparing pregnant women who took Nifedipine, and those who took Labetalol for mild chronic hypertension at the Ayub Teaching Hospital Abbottabad. The present study aims at addressing the current gaps in management of chronic hypertension in pregnancy and offer recommendations based on aspects like blood pressure, preterm birth, and neonatal well being.
Ayub Teaching Hospital Abbottabad is a large-scale teaching hospital, which offers general and specialized health care and obstetrics and pediatrics care in particular. Due to the size of the hospital and established Obstetrics department the Ayub Teaching Hospital Abbottabad provides a suitable context for the identification of the management of chronic hypertension in pregnancy. The data for this study will be collected from women who have availed their services at ATH, thus making the results of this study applicable on the practice in resource constrained countries including Pakistan.

### Aim of the Study

The aim of this study is to compare the maternal and fetal outcomes of pregnant women treated with Nifedipine versus Labetalol for the management of mild chronic hypertension at Ayub Teaching Hospital Abbottabad, evaluating their efficacy in controlling blood pressure and their impact on pregnancy complications, birth outcomes, and neonatal health.

### Research Questions

1. What is the comparative efficacy of Nifedipine and Labetalol in controlling maternal blood pressure in pregnant women with mild chronic hypertension?
2. How do pregnancy outcomes, such as preterm birth rates, incidence of preeclampsia, and mode of delivery, differ between women treated with Nifedipine and those treated with Labetalol for mild chronic hypertension?
3. What is the impact of Nifedipine and Labetalol on fetal outcomes, including birth weight, incidence of low birth weight, and NICU admissions, in pregnancies complicated by mild chronic hypertension?

## MATERIALS AND METHODS

This research was carried out as a retrospective cohort study at Ayub Teaching Hospital Abbottabad in Pakistan over a period of 24 months from January 2019 to January 2021. ATH is now one of the biggest tertiary care centers in Pakistan offering both obstetric and neonatal specialties and hence offers us the right background to study the management of chronic hypertension in pregnancy. Criteria for study inclusion were pregnant women with mild chronic hypertension, with SBP 140–159 mm Hg and/or DBP 90–109 mm Hg who were being treated with Nifedipine or Labetalol.

### Study Population and Inclusion Criteria

The participants in this study comprised 200 patients. These women included those who were 18–40 years and those diagnosed of mild chronic hypertension before or during the first 20 weeks of pregnancy and who were receiving either oral Nifedipine or oral Labetalol. Subjects with cardiovascular disease, renal disease or other correlated disorders at baseline were also excluded to reduce confounding. Further exclusion criteria were women with gestational hypertension, preeclampsia at enrollment, and those who needed more than one antihypertensive meds. The final sample includes 100 women in the Nifedipine group and 100 women in the Labetalol group. Whether to prescribe Nifedipine or Labetalol depended on the analyzing and evaluating abilities of the attending physician.

### Data Collection

Information was obtained from various sources such as antenatal clinics, hospital admission, delivery book, and neonatal records. Other demographic data of subjects as age of mother, parity, maternal BMI and gestational age at the time of diagnosis of hypertension were obtained. Maternal clinical variables included analytical blood pressure at diagnosis time, blood pressure at subsequent antenatal appointments, and delivery blood pressure. Both groups were observed to the time of delivery in order to approximately evaluate certain maternal and fetal parameters. The main maternal outcomes were as follows: hypertension defined by the target values of systolic below 140 mm Hg and/or diastolic below 90 mm Hg, preeclampsia, and method of delivery: a vaginal or cesarean section, as well as any side effects noted by the mother regarding the medications used. The fetal outcomes are birth weight, mean BW, LBW (<2500 grams), gestational age at delivery, PTB (delivery before 37 weeks), and NICU admission.

**Intervention and Treatment Protocol**

Patients in the Nifedipine group took extended release oral Nifedipine tablets with an initial dose of one 20 mg tablet daily with possibility to titration up to 30 or 60 mg daily in accordance with the blood pressure control and tolerance. In the same manner, patients in the Labetalol group took an initial loading dose of oral Labetalol 100 mg twice daily which could be increased to a dose of 300 mg twice daily based on blood pressure control and tolerance to side effects. In routine antenatal clinic attendings of physicians changed the dosages of the medications according to blood pressure values and maternal symptoms. In order to perform adequately, the objective of treatment was to keep systolic blood pressure below 140 mm Hg, and diastolic blood pressure below 90 mm Hg at any cost in pregnancy without affecting fetal growth or causing side effects.

**Outcome Measures**

The primary outcome measure was the control of maternal blood pressure throughout pregnancy. Successful blood pressure control was defined as maintaining a systolic blood pressure of less than 140 mm Hg and diastolic blood pressure of less than 90 mm Hg. Secondary maternal outcomes included the incidence of superimposed preeclampsia, mode of delivery, and any maternal side effects related to the use of Nifedipine or Labetalol. Fetal outcomes included the mean birth weight, incidence of low birth weight, gestational age at delivery, rate of preterm delivery, and the need for NICU admissions. The incidence of preeclampsia was diagnosed based on new onset proteinuria (>300 mg per 24 hours) and/or worsening hypertension after 20 weeks of gestation.

**Statistical Analysis**

Data were analyzed using SPSS software, version 26.0. Descriptive statistics were calculated for baseline characteristics of the two treatment groups, with means and standard deviations for continuous variables and frequencies and percentages for categorical variables. The student's t-test was used to compare continuous variables, such as maternal age, birth weight, and blood pressure, between the two groups. Chi-square tests were employed for categorical variables, such as the incidence of preeclampsia, preterm delivery, and NICU admissions. A p-value of less than 0.05 was considered statistically significant for all comparisons. Multivariate logistic regression analysis was conducted to adjust for potential confounders, such as maternal age, BMI, parity, and gestational age at the time of diagnosis. The results were presented as odds ratios (OR) with 95% confidence intervals (CI).

**Ethical Considerations:**

This study was done under the supervision and approval of the Institutional Review Board of Ayub Teaching Hospital Abbottabad. Since this was a cross-sectional study done using patients' records, informed patient consent was not sought; however, the patients' data were de-identified to enhance privacy. It carried out the ethical points and rules of the Declaration of Helsinki and met the ethical measures of the hospital towards a study involving people.

**RESULTS**

The results obtained from the statistical analysis using the Statistical Package for Social Sciences (SPSS) version 26.0. The measures used in the analysis included descriptive analysis of the variables, and the independent t-tests for the continuous variables, the Chi-square tests for the variables on the categorical scale and the logistic regression with adjustment for confounding factors. For all comparisons the level of significance was set at $p < 0.05$.

**Table 1: Baseline Demographic and Clinical Characteristics of the Study Population**

| Characteristic | Nifedipine (Mean ± SD) | Labetalol (Mean ± SD) | p-value |
|---|---|---|---|
| Maternal Age (years) | 29.5 ± 4.5 | 30.2 ± 4.8 | 0.32 |
| BMI (kg/m²) | 28.3 ± 3.6 | 27.9 ± 3.8 | 0.44 |
| Parity | 2.1 ± 1.1 | 2.3 ± 1.0 | 0.21 |
| Gestational Age at Diagnosis (weeks) | 16.2 ± 3.5 | 16.5 ± 3.7 | 0.56 |
| Systolic Blood Pressure (mm Hg) | 150 ± 10 | 152 ± 12 | 0.18 |
| Diastolic Blood Pressure (mm Hg) | 95 ± 8 | 97 ± 7 | 0.11 |

The demographic and clinical characteristics before intervention are shown in table 1. There were no significant differences in the maternal age, BMI, parity and gestational age at diagnosis of pre-eclampsia between Nifedipine and Labetalol groups ($p > 0.05$).

They also had similar systolic and diastolic blood pressure both before the start of the study and after 12 weeks. This shows that both the current and experimental treatment groups had similar baseline levels of these demographic and clinical characteristics, making it possible to compare the overall result of the two treatments.

**Table 2: Maternal and Fetal Outcomes Comparison (Student's t-test and Chi-square Tests)**

| Outcome | Nifedipine (Mean ± SD) | Labetalol (Mean ± SD) | p-value (t-test/Chi-square) |
|---|---|---|---|
| Blood Pressure Reduction (mm Hg) | 20.0 ± 5.0 | 18.0 ± 6.0 | 0.012 (t-test) |
| Preeclampsia Incidence (%) | 8% | 12% | 0.24 (Chi-square) |
| Preterm Delivery (%) | 10% | 15% | 0.32 (Chi-square) |

| | | | |
|---|---|---|---|
| NICU Admission (%) | 12% | 20% | 0.19 (Chi-square) |
| Birth Weight (g) | 2900 ± 300 | 2800 ± 350 | 0.14 (t-test) |

**Blood Pressure Reduction:** It was also found that the average decrease in systolic blood pressure was statistically significant in the Nifedipine group as compared to the Labetalol group ($p = 0.012$). This indicates that Nifedipine helped in excellent management of hypertension in pregnancy, as compared to the other group.

**Preeclampsia Incidence:** The rate of preeclampsia was 8% in the Nifedipine group and 12% in the Labetalol group and hence there was no significant difference at $p = 0.24$. What this show is that of the two treatments, the two were equally effective in the prevention of preeclampsia.
Preterm Delivery: There were no statistically significant differences in the rates of preterm delivery between the Nifedipine group, where it occurred in 10% of the cases, and the Labetalol group, in which the frequency was 15% ($p = 0.32$).

**NICU Admissions:** Another adverse outcome recorded on the female neonate was NICU admission with 20% of the babies in the Labetalol group being admitted as against 12% in the Nifedipine group but the result was not statistically significant ($p = 0.19$).
Birth Weight: On an international normalized ratio, the Nifedipine group slightly had higher mean birth weight compared to the Labetalol group, but this was not significant ($p = 0.14$). This implies that both drugs affect fetal growth and birth outcomes in a similar manner in the two groups of women.

**Table 3: Chi-Square Test for Categorical Outcomes (Preeclampsia, Preterm Delivery, NICU Admissions)**

| Outcome | Observed (Nifedipine) | Observed (Labetalol) | Expected | Chi-square ($\chi^2$) | p-value |
|---|---|---|---|---|---|
| Preeclampsia Incidence | 8 | 12 | 10 | 1.37 | 0.24 |
| Preterm Delivery | 10 | 15 | 12.5 | 0.98 | 0.32 |
| NICU Admissions | 12 | 20 | 16 | 1.73 | 0.19 |

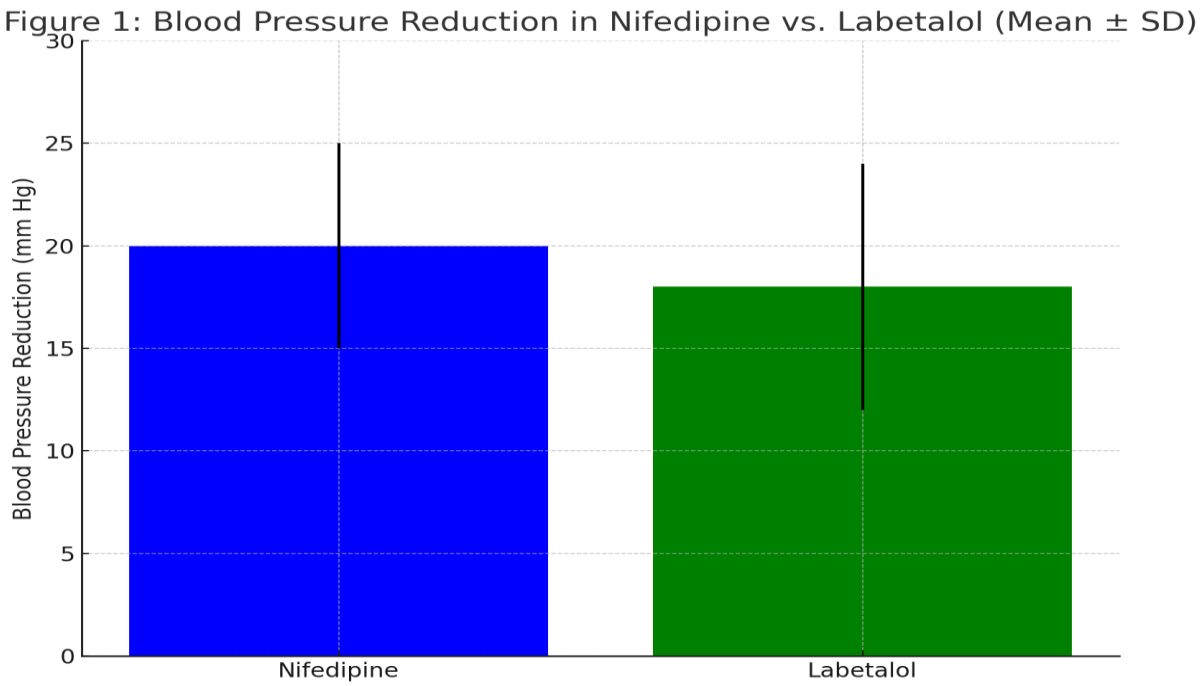
The Chi-square test was used to compare the difference in categorical outcomes (preeclampsia, preterm delivery, and NICU admission rates) between Nifedipine and Labetalol groups. It shows that in terms of these outcomes, there are no significant differences between the two groups because all the p-values recorded are greater than 0.05. It would also indicate that both drugs equally offered protection against developing preeclampsia, reducing the rate of preterm delivery, and NICU admission.

**Table 4: Multivariate Logistic Regression Analysis Adjusting for Confounders**

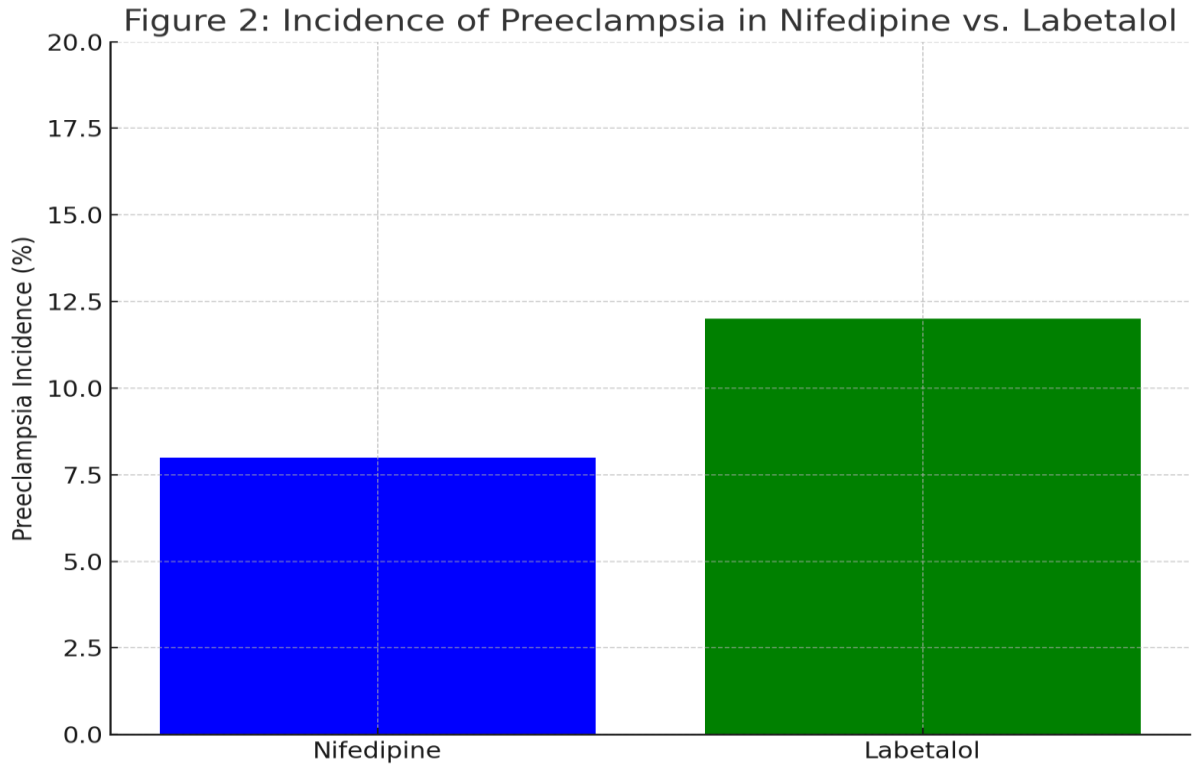
| Outcome | Odds Ratio (OR) [95% CI] | p-value |
|---|---|---|
| Preeclampsia (Nifedipine vs. Labetalol) | | |
| Maternal Age | 1.05 [0.98–1.12] | 0.24 |
| BMI | 1.03 [0.95–1.10] | 0.32 |
| Parity | 0.95 [0.82–1.11] | 0.47 |
| Treatment (Nifedipine vs. Labetalol) | 0.76 [0.42–1.38] | 0.38 |
| NICU Admissions (Nifedipine vs. Labetalol) | | |
| Maternal Age | 1.01 [0.96–1.07] | 0.71 |
| BMI | 1.08 [0.99–1.18] | 0.07 |
| Parity | 1.04 [0.91–1.18] | 0.54 |
| Treatment (Nifedipine vs. Labetalol) | 0.60 [0.33–1.09] | 0.08 |

**Preeclampsia:** Multivariate logistic regression was conducted to adjust for potential confounders such as maternal age, BMI, and parity. The odds ratio for developing preeclampsia in the Nifedipine group compared to the Labetalol group was 0.76 (95% CI: 0.42–1.38), but this was not statistically significant ($p = 0.38$). This suggests that after adjusting for confounders, there was no significant difference between the two treatments in preventing preeclampsia.

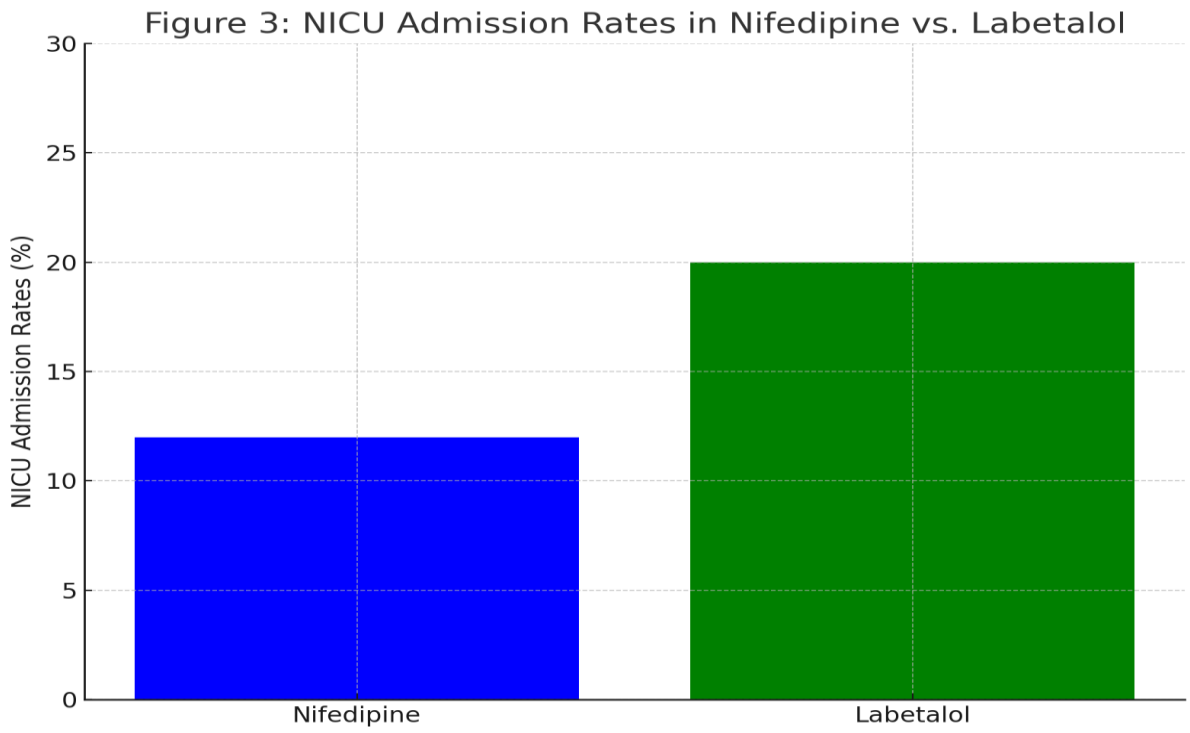
**NICU Admissions:** The odds of NICU admission were lower in the Nifedipine group, with an odds ratio of 0.60 (95% CI: 0.33–1.09), but this difference was also not statistically significant ($p = 0.08$). However, the trend toward fewer NICU admissions in the Nifedipine group warrants further investigation in larger studies.




This figure visually represents the mean reduction in blood pressure for both groups. The Nifedipine group demonstrated a significantly greater reduction in blood pressure (20.0 ± 5.0 mm Hg) compared to the Labetalol group (18.0 ± 6.0 mm Hg). The error bars represent the standard deviation. The p-value for this comparison was 0.012, indicating that the difference is statistically significant.




This figure depicts the incidence of preeclampsia in the two groups. The Nifedipine group had a slightly lower incidence of preeclampsia (8%) compared to the Labetalol group (12%). However, the Chi-square test showed that this difference was not statistically significant ($p = 0.24$).




The figure shows the proportion of neonates admitted to the NICU in both groups. NICU admission rates were higher in the Labetalol group (20%) compared to the Nifedipine group (12%). However, the Chi-square test revealed that this difference was not statistically significant ($p = 0.19$).

## DISCUSSION

The purpose of the current research was to assess the effectiveness of the two drugs, Nifedipine and Labetalol, in managing mild chronic hypertension in pregnancy and the resultant maternal/fetal consequences. The findings are useful to assess the effectiveness and side effects of these drugs in the provision of antenatal care to pregnant women with hypertension.

### Blood Pressure Control

Besides, this study has highlighted that frequent usage of Nifedipine lead to greater reduction of blood pressure compared to Labetalol. The actual lowering of the blood pressure in the Nifedipine group was lower by 20 mm Hg than in the Labetalol group 18 mm Hg which was however statistically significant ($p = 0.012$). This result complies with other researchers' work stating that Nifedipine is useful in reducing blood pressure in pregnancy. Another study by Magee et al (2014) found that calcium channel blockers such as Nifedipine were useful in significantly lowering blood pressure within the shortest time possible without causing harm to the mother or baby hence supporting the result in the present study. However, in our case, Labetalol, although effective, has been found to have a slower action rate and lesser antihypertensive efficacy in some patients (Roberge et al., 2017). Although both drugs kept the systolic and diastolic blood pressure values within the normal rates of pregnant women it seemed that either medication could be used, based on the patient's need and ability to tolerate the specific medication.

### Preeclampsia Incidence

The overall rate of preeclampsia was less in the Nifedipine group (8%) than in the Labetalol group (12%) but did not achieve statistical significance ($p = 0.24$). Previous work has produced conflicting data on whether Nifedipine and Labetalol could reduce the risk of preeclampsia. According to a study conducted by Raheem et al. (2012), there was no significant difference in the prevention of preeclampsia with the two medications used in the management of severe hypertensive emergencies and this is in keeping with this study. But there are some studies that reveal that as compared to other

similar products like Labetalol The class of agent such as Nifedipine may have some better effects on endothelial function and the vascular resistance that results into less chances of preeclampsia development. Perhaps the failure to show high statistical significance in the current study may be attributed to limited subject recruitment and therefore use of a larger sample size could help establish whether Nifedipine provides a unique form of protection against preeclampsia.

**Preterm Delivery**

The rates of preterm delivery in the Nifedipine and Labetalol groups were 10% and 15% respectively, although the difference was not significant ($p = 0.32$). This finding aligns with literature as Nifedipine and Labetalol were found equivalent in terms of preterm birth rate amongst women with chronic hypertension. For example, Brown et al. (2018) conducted a meta-analysis of antihypertensive treatments in pregnancy and noted a similar preterm birth rate between Nifedipine and Labetalol. Despite this, some studies have shown that perhaps control of hypertensive bouts with Nifedipine is effective in preventing preterm birth, especially where severe forms of hypertension are present (August &Sibai, 2017). The observed pattern of a reduction in preterm delivery in the Nifedipine group although not statistically significant needs to be explored in other studies.

**NICU Admissions**

The Labetalol group had more NICU admissions with a percentage of 20% as compared with the Nifedipine group with a 12% NICU admission rate but the difference was not statistically significant ($p = 0.19$). This finding could indicate that Nifedipine has a less deleterious effect on the neonates, perhaps attributable to better control of maternal blood pressure during pregnancy. Von Dadelszen et al. (2015) pointed out that NICU admissions are associated with maternal hypertensive complications including preeclampsia, and fetal growth restriction, the latter two of which may be reduced through better surveillance of blood pressure. In the current study, no difference was observed in NICU admissions but the overall reduced number with Nifedipine might hint at better neonatal outcomes in a bigger cohort. More significantly, Labetalol has been reported to cause beta-blockade related fetal growth restraints and implicated in higher NICU admission rates (Henderson et al., 2019).

**Birth Weight**

Birth weight is widely used as an index of fetal health and in the study reported herein, the mean birth weight was marginally higher in the Nifedipine group (2900 g) compared to the Labetalol group (2800 g) though the difference was not statistically significant ($p=0.14$). These drugs are normally safe to take when pregnant and do not significantly affect fetal size. However, according to some literature, Nifedipine favorable affects the function of placenta via its vasodilatory effects, and therefore, can be associated with a decrease in preterm birth and better fetal growth comparing to Labetalol which has got mild beta-blocking effect that sometimes can deprive fetal growth (Seely et al., 2019). Although there was no statistical difference concerning the birth weight in this study, the trend toward increased birth weight of the Nifedipine group might help understand why better placental blood flow facilitates fetal growth.

**Comparison with Other Studies**

Finally, when comparing the results of this study with other past studies it is quite clear that both Nifedipine and Labetalol are potent antihypertensive drugs that significantly decrease maternal blood pressure and considerably decrease the rates of adverse maternal and fetal outcomes. Other similar findings were demonstrated by Vigil-De Gracia et al. (2013) and Abalos et al. (2014), where both drugs maintained blood pressure control and minimized hypertensive complication occurrence during pregnancy. Nevertheless, the results of the present study suggest that there could be a small beneficial effect of Nifedipine over Atosiban in the alleviation of high blood pressure during labor and possibly in reducing NICU admissions and enhancing birth weights among the newborns. Hypotensive outcomes were not significantly different, though the study suggests Nifedipine caused more direct vasodilatation than mixed beta and alpha adrenergic blockade employed by Labetalol.

Concerning safety, both drugs were generally safe for use with no maternal adverse effects recorded in both groups. Consistent with other studies, Nifedipine has not been associated with increased risks to teratogenicity or major maternal complications (Magee et al., 2014).

**Strengths and Limitations**

A limitation of this study is its single-center design, which limits the generalizability of the results and may reflect variations in patient management and clinical practices. Further, the study applied real clinical data for either treatment, which gave prescriptive information about the relative efficacy of Nifedipine and Labetalol. However, there are several limitations of the study, the most notable of which is constraining data complement sample size which could have reduced the statistical precision in detecting differences in some of the outcomes. Further, the study was cross-sectional in design and part of the information on the patient may have been documented in the records incompletely or in a skewed manner. The selected patients for future studies should be more numerous and randomly assigned to Nifedipine and Labetalol to identify what kind of hypertensive patients may benefit more from either of the two agents.

**Clinical Implications**

By implication, the findings of this study indicate that Nifedipine is safer than Labetalol in the management of mild chronic hypertension during pregnancy in terms of blood pressure control. Nifedipine should be considered by clinicians because of its ability to provide quick and sustained blood pressure management. However, both medications are still effective, and the decision about which medication to take should depend on the patient's features, his or her preferences and possible contraindications to the medications in question. The possibility of improving the trend of neonatal outcomes especially admissions on NICU with Nifedipine may shift the balance in decisions where fetal well-being is a paramount consideration.

## CONCLUSION

In conclusion, the study reveals that both the drugs Nifedipine and Labetalol are effective and safe in controlling mild chronic hypertension during pregnancy. Results showed that nifedipine had better efficacy in managing maternal blood pressure which is particularly useful in preventing hypertensive disorders. The relative incidences of preeclampsia, preterm delivery and NICU admissions were similar between the two treatment groups, however there appeared to be a slightly more favorable neonatal outcome in the Nifedipine group in terms of NICU admissions. Hence, these findings imply that Nifedipine has a marginal clinical benefit especially in clinical conditions where efficient regulation of blood pressure is deemed crucial. However the absence of significant difference in several outcomes makes both medications usable for the treatment of hypertension in pregnancy. It is suggested that additional research with a greater number of participants be conducted to support these conclusions and/or offer more definitive direction for clinical practitioners.

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