Journal of Shaheed Ziaur Rahman Medical College
https://www.szmcjournal.com/
ISSN: 1607-5854
Volume 45: Issue 2; July 2026.

OPEN ACCESS

ORIGINAL ARTICLE

Comparison between Methyldopa and Labetalol in the Management of Pregnancy Induced Hypertension at a Tertiary Care Hospital

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Received: 04/06/2026 **Revision: 08/07/2026** **Accepted: 20/08/2026**

ABSTRACT

Background: Pregnancy induced hypertension (PIH), a common medical problem, is a major cause of maternal morbidity and mortality. Aim of the study was to compare the obstetric outcome of methyldopa and labetalol in the management of PIH.

Methods: Total 120 patients having PIH were included and was divided into two groups. Group A: Methyldopa and Group B: Labetalol, doses as needed. Pre and post treatment blood pressure was measured on day 2nd, 7th and day 21st and was compared. Reduction of blood pressure, obstetric outcome and side effects of methyldopa and labetalol were observed.

Results: Mean Blood pressure in group A: Pre-treatment - 157/104±10 mmHg, on 2nd day - 137/89±10 mmHg, on 7th day - 127/85±10 mmHg and on 21st day - 120/78±10 mmHg. And in group B mean blood pressure was: pre-treatment 162/108±10 mmHg, on 2nd day - 130/84±10 mmHg, on 7th day - 122/80±10 mmHg and on 21st day - 115/74±10 mmHg. No significant difference was found between the two groups ($p>0.05$). It was observed that about 25% of spontaneous vaginal deliveries happened with methyldopa users and 35% among labetalol users. Regarding induced deliveries 22% were with methyldopa and 28% with labetalol. And, LUCS had to be done in 53% with methyldopa and 37% with labetalol. Preterm deliveries were 35% with methyldopa and 30% with labetalol.

Conclusion: Methyldopa and Labetalol have effectively controlled the blood pressure in PIH patients, but no significant difference was observed between the two groups.

Keywords: Labetalol, Methyldopa, Pregnancy induced hypertension (PIH).

INTRODUCTION

Hypertension is the most common medical problem encountered during pregnancy. Hypertension complicates up to 10% of all pregnancies and is associated with increased risk of adverse fetal, neonatal and maternal outcomes, including preterm birth, diabetes, chronic hypertension, perinatal death, acute renal or hepatic failure, antepartum haemorrhage, postpartum haemorrhage and maternal death[1]. During this period the maternal and fetal condition are monitored along with control of hypertension[2]. The risk of developing complications of hypertension is reduced to half by using antihypertensive medications [3]. A wide spectrum of antihypertensive agents represents the key to successful treatment of pregnancy induced hypertension (PIH) and provide opportunities of choice [4]. Today, though medications are available and widely used for the treatment of PIH, physicians still must deal with many challenges. Antihypertensive drugs are often used to lower blood pressure with the aim of preventing its progression to adverse outcomes[5].

The main objective of giving antihypertensive agent in pregnancy induced hypertension is to prevent cerebrovascular accidents and congestive heart failure in mothers without compromising uteroplacental blood flow. The main benefit of antihypertensive is to allow safe prolongation of pregnancy, which has to be balanced against potential fetal side effects of the drugs[6]. Methyldopa is centrally acting adrenergic antagonist that

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acts by stimulating central alpha 2 receptors leading to decrease in sympathetic activity with resultant arterial dilatation and reduction of blood pressure. It has high incidence of side effects because of its central actions[1]. Labetalol is a mixed alpha and beta-blocking medication and has the advantage over other beta blockers as it has an extra arteriolar vasodilating effect that helps to decrease peripheral vascular resistance with a slight or no decrease in cardiac output[7].

The major goal of antihypertensive medication in PIH is to prevent or treat hypertension and its associated complications and to prolong pregnancy for as long as possible. In this study showed comparison on obstetric outcome of methyldopa versus labetalol in the management of pregnancy induced hypertension. This study may help physicians choose an antihypertensive medication considering their blood pressure controlling effect and adverse effect.

MATERIAL AND METHODS

This observational outdoor-based study was done at Sir Salimullah Medical College Mitford Hospital (SSMCMH) and Shaheed Suhrawardy Medical College Hospital (ShSMCH) after approval from institutional ethical committee. It was an open label trial. All pregnant women with pregnancy induced hypertension attending outpatient department of Obstetrics and Gynecology of SSMCMH & ShSMCH who received methyldopa and labetalol were the study population. All pregnant women within 20th to 38th weeks of pregnancy with blood pressure more than 140/90 mmHg without any anti-hypertensive drug at the time of enrollment were included in this study. Pregnant women having proteinuria, preeclampsia, diabetes mellitus, bronchial asthma, thyrotoxicosis, haematological disorder, multiple gestations were excluded from this study. The study group consisted of patients selected on the basis of inclusion and exclusion criteria. All patients were divided and randomized into two groups, Group- A and Group-B. Group A consisted of 60 patients and received Tab. Methyldopa 250-500 mg twice daily. Group B consisted of 60 patients and received Tab Labetalol 100-400 mg twice daily. Before giving antihypertensive, blood pressure and pulse rate were recorded and urinary albumin was examined. Blood pressure was measured with patient in recumbent position after 20 min rest. Patients were followed up on the 2nd day, 7th day and 21st day after initiation of treatment. At each follow up visit BP was measured and maternal side effects as hypotension, headache, flushing, nausea, and vomiting was recorded. Data was expressed as mean ± SD. Statistical analysis was done by using statistical package of social service (SPSS). Student t-test and chi-square test were done and $p<0.05$ was considered as level of significance.

RESULTS

Table I shows the baseline demographic characteristic of all pregnancy induced hypertensive patients. Considering demographic characteristics.

Table-I: Demographic Characteristics of both groups before intervention

Characteristics	Group-A Mean ±SD (n=60)	Group-B Mean ± SD (n=60)
Age (year)	25.20 ± 5.01	25.60 ± 5.21
Gravida	1.51 ± 0.87	1.85 ± 1.19
Gestational Age (week)	32.05 ± 4.01	32.61 ± 4.09
Body Weight (kg)	63.1 ± 9.5	64.8 ± 8.7

Before administration of methyldopa blood pressure level (mean±SD) was 157/104±10 mmHg which was reduced to 137/89±10 mmHg on 48th hours, 127/85±10 mmHg by 7th day and 120/78±10 mmHg by the 21st day (Table II). This change was statistically significant (P<.05). In labetalol treated group pretreatment blood pressure (mean ±SD) was 162/108±10 mmHg which was reduced to 130/84±10 mmHg on 48th hours, 122/80±10 mmHg by 7th day and 115/74±10 mmHg by the 21st day (Table III). This change was statistically significant too. But after intervention no statistically significant difference was found in between the two groups (p>.05) (Table IV).

Table-II: Effects on Blood Pressure of methyldopa treated group

Systolic/Diastolic Blood Pressure (mm Hg)		
Group-A (n = 60) Mean±SD		'P' value
Pre-treatment 157±7.9/104±8.07	48 hr after treatment 137±6.65/89±13.17	.001/.001
48 hr after treatment 137+6.65/89±13.17	7th day after treatment 127±7.2/85±5.95	.001/0.039
7th day after treatment 127±7.2/85±5.95	21 days after treatment 120±6.38/78±5.14	.001/.004

Table-III: Effect on Blood Pressure of labetalol treated group

Systolic & Diastolic BP (mm Hg)		
Group- B (n = 60) Mean±SD		'P' value
Pre-treatment 162±9.57/108±8.50	48 hr after treatment 130±7.13/84±6.7	0.001/.001
48 hr after B 130±7.13/84±6.7	7th day after R 122±8.7/80±7.13	.001/.001
7th day after R 122±8.7/80±7.13	21st day after R 115±5.97/74±6.09	.001/.001

Table IV: Inter group comparison of Methyldopa and Labetalol

Systolic & Diastolic BP (mm Hg)		
Group- A (n = 60)	Group B (n=60)	'P' value
Pre- treatment		
157±7.9/104±8.07	167±9.57/108±8.5	0.1/0.38
48 hr after treatment		
137±6.65/89±1	130±7.13/84±6.7	0.43/0.
7th day after treatment		
127±7.2/85±5.95	115±5.97/74±6.09	0.1/0.38

It was observed that about 25% of spontaneous vaginal deliveries happened with methyldopa users when compared to 35% among labetalol users & 22% induced deliveries with methyldopa as against 28% with labetalol and 53% LUCS with methyldopa as

against 37% LUCS with labetalol. But in total among both the groups LUCS was little bit more happened among patients receiving methyldopa.

Table V: Distribution of mode of delivery

Mode of delivery		Group -A (n=60) n (%)	Group-B (n=60) n (%)
Vaginal delivery	Spontaneous	15 (25%)	21 (35%)
	Induced	13 (22%)	17 (28%)
LUCS	Elective	13 (22%)	06 (10%)
	Emergency	19 (31%)	16 (27%)

Further it was observed that Preterm deliveries were only 35% with methyldopa as against 30% with labetalol.

Table VI: Distribution of preterm & Term Delivery

Mode of Delivery	Group-A (n=60) n (%)	Group-B (n=60) n (%)
Preterm	21 (35%)	18 (30%)
Term	39 (65%)	42 (70%)

With reference to low-birth-weight babies were more among Methyldopa users (40%) when compared Labetalol users (35%) (Figure 1).

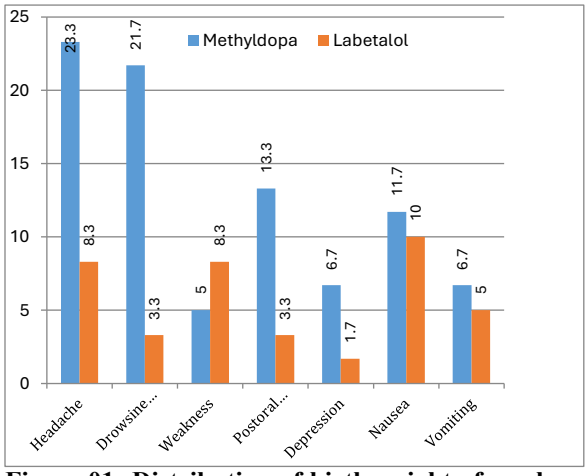


Figure 01: Distribution of birth weight of newborn babies of study subject

Both Methyldopa and Labetalol were well tolerated by patients of the present study. Headaches, drowsiness and postural hypotension were common in Methyldopa treated group and nausea, headache and weakness were common in labetalol treated group (Figure 2). No serious adverse effects were seen in both the groups that needed dose adjustment or withdrawal of the drug.

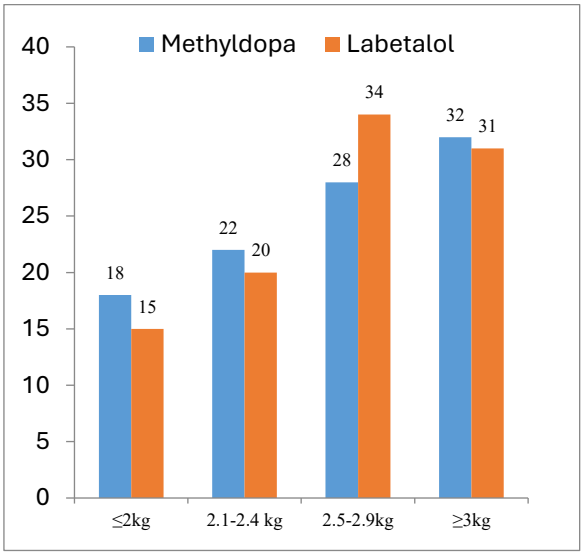


Figure 2: Bar chart of adverse drug effects of the study subjects in both groups

DISCUSSION

This observational hospital-based study was carried out to compare the obstetric outcome of methyldopa versus labetalol in the management of pregnancy induced hypertension. This study showed the mean age of the women with pregnancy induced hypertension was 25.20 ± 5.01 years in group A & 25.60 ± 5.21 years in group B. Mean gestational age was 32.05 ± 4.01 in group A & 32.61 ± 4.09 in group B. Similar finding were found to the study done by Saleem, et al., 2025, which shown mean age of the women with pregnancy induced hypertension was 28.7 ± 4.2 years and mean gestational age was 31.4 ± 2.3 weeks[8].

In the present study pre and post treatment systolic and diastolic blood pressures were measured and compared between Methyldopa and Labetalol treated group on 2nd, 7th and 21st day after drug treatment. The mean pre-treatment blood pressure in group A was 157/104±10 mmHg which was reduced to 137/89±10 mmHg on 48th hours, 127/85±10 mmHg by 7th day and 120/78±10 mmHg by the 21st day. In group B mean pre-treatment blood pressure was 162/108±10 mmHg which was reduced to 130/84±10 mmHg on 48th hours, 122/80±10 mmHg by 7th day and 115/74±10 mmHg by the 21st day. The study observed the beneficial effects of Methyldopa and labetalol in controlling blood pressure. Both the drugs significantly reduced the blood pressure and then maintained normal BP level. Nahar et al. 2022 stated that both methyldopa and labetalol provided efficient control of blood pressure in PIH[9]. Koopmans et al 2009 stated that Methyldopa had particular benefit among PIH women in case of perinatal outcome and preterm delivery[10].A prospective study conducted by Nita et al 2012 stated that Labetalol was more effective than Methyldopa in controlling blood pressure in patients with PIH[11]. Study done by Saad et al., 2025 found that labetalol was more successful than

methyldopa at controlling blood pressure in pregnant patients with hypertension in a short amount of time[12].

It was observed that about 25% of spontaneous vaginal deliveries happened with methyldopa users when compared to 35% among labetalol users & 22% induced deliveries with methyldopa as against 28% with labetalol and 53% LUCS with methyldopa as against 37% LUCS with labetalol. But in total among both the groups LUCS was little bit more happened among patients receiving methyldopa.

This result is also similar to study done by Darsini, et al., 2024 also observed that about 32% of spontaneous vaginal deliveries happened with labetalol users when compared to 20% among methyldopa users & 25% induced deliveries with labetalol as against 21% with methyldopa and also 43% LUCS with abetalol as against 59% LUCS with methyldopa but totally among both the groups LUCS was little bit more happened among patients receiving methyldopa[13].

Further it was observed that Preterm deliveries were only 35% with methyldopa as against 30% with labetalol. This result is also similar to study done by Darsini, et al., 2024 was observed that preterm deliveries were only 23% with labetalol as against 40% with methyldopa[13].

With reference to low-birth-weight babies were more among methyldopa users (40%) when compared labetalol users (35%). This result is also like study done by Darsini, et al., 2024 also showed that low birth weight babies were more among methyldopa users (55%) when compared labetalol users (50%)[13].

Regarding drug related adverse effects most common adverse effect was headache, 14 (23.3%) patients in methyldopa group and 5 (8.3%) in labetalol treated group. The other adverse effects included drowsiness and postural hypotension which was more in patients treated with methyldopa. The incidence of side effects such as nausea and vomiting was similar in both groups. Study conducted by Verma et al. 2012 stats that adverse effects observed were lower in labetalol group compared to methyldopa group [14].

CONCLUSION

Both Methyldopa and Labetalol have effectively controlled the blood pressure in pregnancy induced hypertensive patients. No significant difference is observed between the two groups. Early registration of pregnancy & regular antenatal check-ups will enable to identify the problem early and thereby allow us to start intervention early to reduce the maternal and fetal complications.

Further our study proved that labetalol was generally considered to be more effective drug than methyldopa for treating pregnancy-induced hypertension in terms of rapid ruction of hypertension, prolongation of pregnancy (term deliveries), reduction of LBW babies and overall better in prevention and control of maternal & fetal complications when compared to methyldopa.

ETHICAL CONSIDERATION

Ethical approval was taken from the ethical review committee of Sir Salimullah Medical College and written consent was taken from the patient with proper explanation. Besides these the participants had rights to withdraw from the study at any point of time. It was assured that all records were kept confidential.

ACKNOWLEDGMENT

First of all, we remember Almighty Allah, for giving us the opportunity and strength to carry on and complete this research work. We thank Gynecology and obstetrics Department of Mitford hospital & Shaheed Suhrawardy medical college hospital who provided data for this study. All authors contributed equally to the creation of the manuscript.

The authors have declared that no competing interest exit.

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How to Cite: *Islam R,* Rahaman MA, Mahmud MI, *et al. Comparison between Methyldopa and Labetalol in the Management of Pregnancy Induced Hypertension at a Tertiary Care Hospital. SZMCJ 2026; 45(02): 43-47.*