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The Efficacy of Labetalol and Methyldopa in Treatment of Pregnancy Induced Hypertension

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Abstract **Original Research Article**

Background: Many people still lack access to health care in countries like Bangladesh, despite the country's impressive record of improvement and growth in this area. Pregnancy-related hypertension is the most prevalent medical issue. ***Objective:*** In this study our main goal is to compare the efficacy of labetalol and methyldopa in treatment of pregnancy induced hypertension. ***Method:*** This study was conducted in the Department of Obstetrics and Gynaecology, Abdul Malek Ukil Medical College, Noakhali over a period of 2 years from September 2019 to September 2021, after taking ethical committee clearance. 180 Pregnancy Induced Hypertensive women after 20 weeks of pregnancy coming to hospital over a period of 2 years on IPD basis from September 2019 to September 2012 were included as sample size. Among 180 patients of PIH, 90 were given Labetalol (group A) and 90 were given Methyldopa (group B)**.** ***Results:*** during the study, with labetalol, the mean arterial pressure on admission was 109.48mmHg which reduced to 96.90mmHg on day 7. Reduction in MAP was statistically significant. On comparing the two drugs, MAP on admission were comparable but on day 7, significant fall in MAP was seen in patients receiving labetalol. In the present study, the mean time required to control BP in group A was 42.22 hours and in group Bit was 36.97 hours. In group A, 40% patients required a dose of 750 mg/day to achieve optimal BPcontrol. Whereas 52% patients had their BP controlled with 300mg / day. Thus the rate of spontaneous labour was more in patients treated with labetalol. Patients in both group where in both group most common side-effect observed was headache. 8% patients in Group A and 7% patients in group B had this symptom. ***Conclusion:*** The freedom from maternal and fetal side-effects, the efficient hypotensive action indicates that labetalol is suitable for use during pregnancy.

Keywords: Pregnancy, Hypertension, Labetalol, Methyldopa.

INTRODUCTION

Despite steady improvement and expansion of health care infrastructure, a sizable minority of people in countries like Bangladesh still lack access to safe childbirth.

Cause-and-effect studies on maternal mortality rates reveal that most of these fatalities may be avoided [1]. About 10% of pregnancies are reportedly complicated by hypertensive disorders, which are a leading cause of maternal and fetal morbidity and death. One of the most prevalent medical issues seen during pregnancy is hypertension. Hypertension is believed to complicate 6-8% of births worldwide [3].

One woman dies every three minutes from complications related to pregnancy and childbirth [2, 4]. Although oral drugs are now often used to treat PIH, doctors still face several obstacles in the field. In order to reduce the risk of complications for both the mother and the fetus, antihypertensive medications are frequently administered during pregnancy. By using antihypertensive drugs, you can cut in half your chance of getting severe hypertension [5]. Treatment of severe hypertension is indicated for the prevention of serious

maternal consequences. If medication therapy is needed for mild to severe hypertension during pregnancy, methyldopa, labetalol, and long-acting nifedipine are all appropriate options.

OBJECTIVE

To compare the efficacy of labetalol and methyldopa in treatment of pregnancy induced hypertension.

METHOD

This study was conducted in the Department of Obstetrics and Gynaecology, Abdul Malek Ukil Medical College, Noakhali over a period of 2 years from September 2019 to September 2021, after taking ethical committee clearance. 180 Pregnancy Induced Hypertensive women after 20 weeks of pregnancy coming to hospital over a period of 2 years on IPD basis from September 2019 to September 2012 were included as sample size. Among 180 patients of PIH, 90 were given Labetalol (group A) and 90 were given Methyldopa (group B). Patients were selected for study by subjecting to following: (i) History (ii) Clinical Examination: General and systemic examination. Inclusion criteria: Diagnosed PIH patients based on criteria- BP more than 140/90 mmHg on two separate occasion 6 hours apart, Proteinuria 1+ dipstick in two midstream urine samples collected 4 hours apart, and after 20 weeks of pregnancy till term.

RESULTS

Table-1: Age distribution

Age group	Methyldopa Group %	Labetalol Group, %
15-24 years	50%	49%
25-34 years	48%	45%
35-44 years	2%	6%

In figure-1 shows gravida distribution where primigravida were 4.2% and multigravida were 95.8% cases. The following figure is given below in detail:

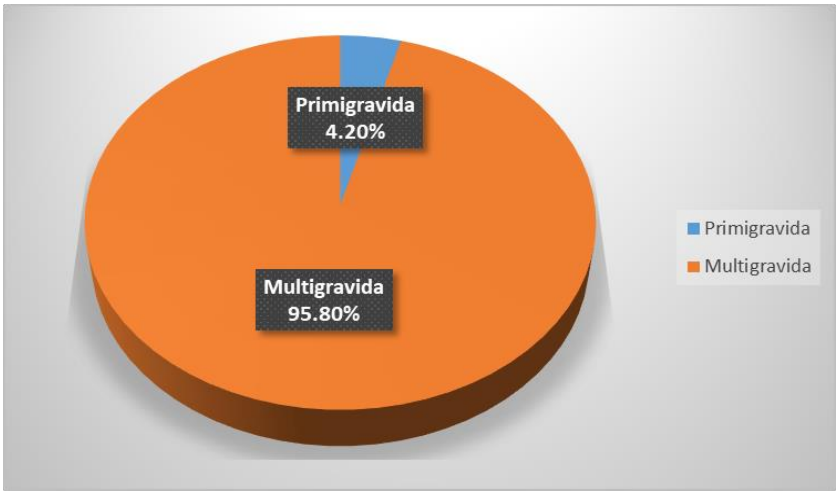

Figure-1: Gravida distribution

Table-2 shows Comparison of MAP in both the groups at Day 1 and Day 7. In the present study, the mean arterial pressure in patients treated with methyldopa on admission was 109.86mmHg, while on day 7 it reduced to 98.15mmHg, with a statistically significant p value<0.05. With labetalol, the mean arterial pressure on admission was 109.48mmHg which reduced to96.90mmHg on day 7. Reduction in MAP was statistically significant. On comparing the two drugs, MAP on admission were comparable but on day 7, significant fall in MAP was seen in patients receiving labetalol.

Table-2: Comparison of MAP in both the groups at Day 1 and Day 7

	Group	N	MEAN	STD	Mean Difference	Z value	P value
Day 1	Methyldopa	90	109.86	2.91	0.37±0.42	0.88	0.37
	Labetalol	90	109.49	2.78			
Day 7	Methyldopa	90	98.15	3.44	1.24±0.46	2.68	0.008
	Labetalol	90	96.90	2.70			

Table-3 shows comparison of Time to control BP in both the groups. In the present study, the mean time required to control BP in group A was 42.22 hours and in group Bit was 36.97 hours. The difference between the two groups was statistically significant with labetalol showing earlier control of BP than methyldopa.

Table-3: comparison of Time to control BP in both the groups

Group	N	MEAN	STD	Z value	P value
Methyldopa	90	42.44	3.04	11.74	0.0001
Labetalol	90	36.97	2.94		

Figure-2 shows distribution of patients according to dose in group-A. In group A, 40% patients required a dose of 750 mg/day to achieve optimal BP control. Out of remaining 40 patients, 25% required a dose of 1000 mg/day to achieve optimal BP control while remaining 22% required a dose of 1500 mg/day.

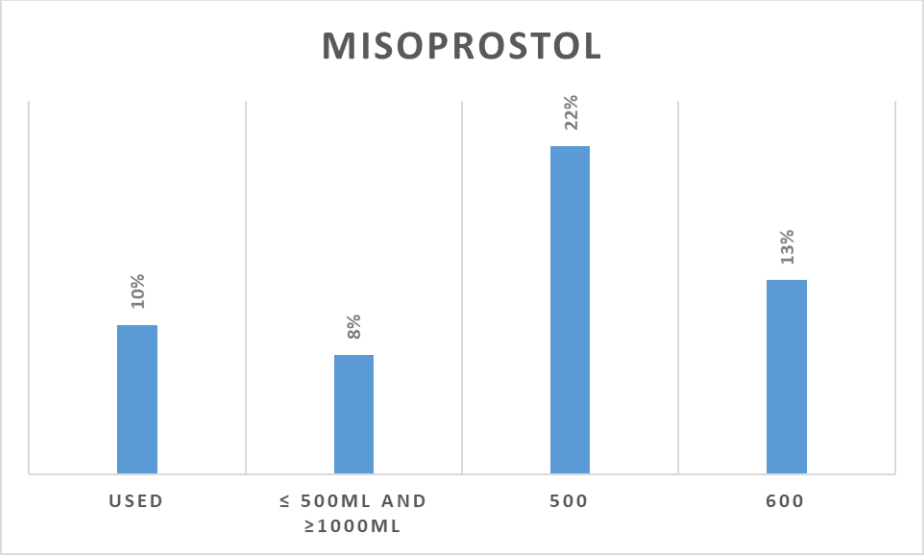

Figure-2: Distribution of patients according to dose in group-A

Figure-3 shows distribution of patients according to dose in group-B. Whereas 52% patients had their BP controlled with 300mg / day. 25% patients required a dose of400mg/day. Of remaining 20 patients, 10% required a dose of 500mg /day and 11% patients required a dose of 600mg /day.

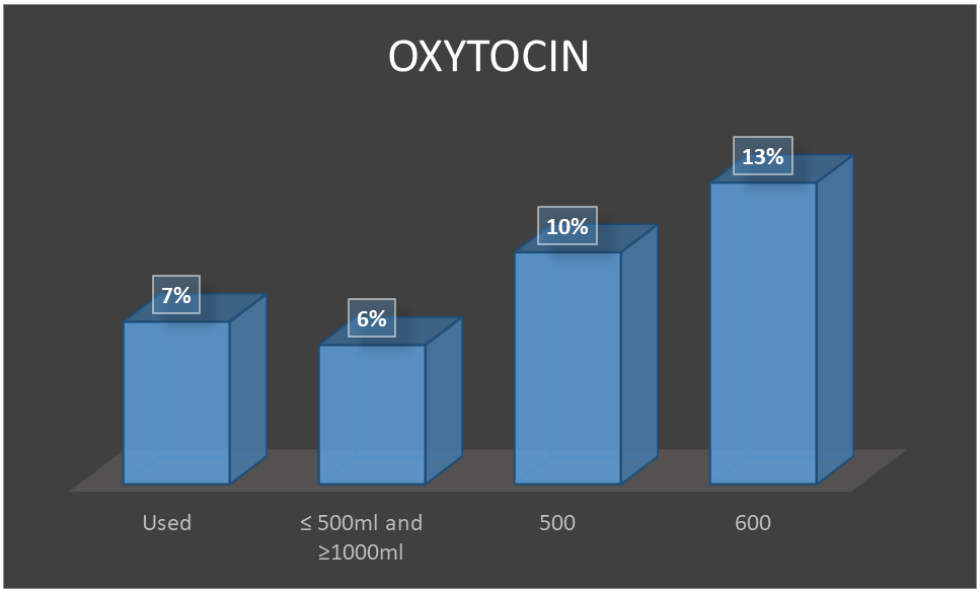

Figure-3: Distribution of patients according to dose in group-B

Table-4 shows labor induction of the group where thus the rate of spontaneous labour was more in patients treated with labetalol. This may be accounted to the fact that labetalol has ripening effect on the cervix.

Table-4: Labor induction of the group

Group	Spontaneous	Induced
Methyldopa Group	48%	52%
Labetalol Group	35%	65%

Table-5 shows side effects of the patients in both group where in both group most common side-effect observed was headache. 8% patients in Group A and 7% patients in group B had this symptom. The other side-effects included drowsiness, more in patients treated with methyldopa, weakness, more in patients treated with labetalol. The incidence of side-effects such as nausea, vomiting, myalgia was similar in both the groups.

Table-5: Side effects of the patients

Side effects	Methyldopa Group	Labetalol Group
Postural Hypotension	0%	.1%
Drowsiness	9%	4%
Headache	8%	7%
Nausea	7%	3%
Vomitting	9%	2%
Weakness	8%	1%
Myalgia	10%	1%

DISCUSSION

On admission, individuals receiving methyldopa had an average arterial pressure of 109.86 mm Hg; on day 7, this had decreased to 98.15 mm Hg (p 0.05).

The average arterial pressure was 109.48 mm Hg upon admission and dropped to 96.90 mm Hg on day 7 when labetalol was administered. It was statistically significant that MAP went down.

At admission, MAP was similar across the two medicines, however on day 7, MAP dropped significantly in the labetalol group. The average MAP before treatment was similar across the two groups, as reported by Lamming *et al.,*

The MAP in the labetalol group dropped by a statistically significant amount (p0.001), but the MAP in the methyldopa group did not change significantly (p>0.05) [8].

Compared to those receiving methyldopa, participants in the labetalol group saw a significantly lower mean arterial pressure (MAP) in a research by El Qarmalawi *et al.*, [9].

In the current study, group A needed an average of 42.22 hours to get their blood pressure under control, whereas group B needed an average of 36.97 hours.

There was a statistically significant difference between the two groups, with labetalol demonstrating quicker control of BP than methyldopa.

Sanders *et al.*, found no significant difference in the meantime to attain optimum blood pressure management between the two groups. 10 Within 24 hours, D.J. Cruickshank *et al.*, [11] found that Labetalol successfully lowered blood pressure in 45 of 51 treated women (88%).

An evident benefit is that 88% (45/51) of patients who take oral labetalol see a favorable response within 24 hours, allowing for quick management of blood pressure.

It is intriguing because other researchers have discovered comparable response rates, such as Lardoux's team (82%), CA Michael (92%), and others. Twelve, thirteen S. F. Hans saw a marked drop in systolic and diastolic pressure between twenty-four and forty-eight hours after beginning methyldopa treatment [14].

In group A, a mean of 1111.11mg was needed to maintain normal blood pressure.

For 40% of patients in group A, a daily dosage of 750 mg was needed for optimum BP control. 25 percent of the remaining 40 patients required a daily dosage of 1000 mg to achieve adequate BP control, while the remaining 22 percent required a daily dose of 1500 mg. whereas blood pressure in 52% of individuals was stabilized at 300 mg/day.

Seventy-five per cent of the population needed 400 mg daily. Ten percent of the remaining 20 patients needed a daily dosage of 500 milligrams, and 11 percent needed a daily dosage of 600 milligrams.

Maintenance dosages of labetalol and methyldopa were found to be 810mg/day and 1183mg/day, respectively, in a research by Sanders *et al.,* The average dose of labetalol needed to achieve adequate B.P control was significantly lower in the current research compared to the aforementioned trial, although the doses necessary for methyldopa were comparable.

On average, the labetalol dosage that Lardoux's team found to be effective in lowering blood pressure was 600 milligrams per day [12].

Patients treated with labetalol had a higher risk of spontaneous labor in the current trial. The ripening action of labetalol on the cervix might be to blame for this. Qarmalawi *et al.,* found that women who took labetalol were more likely to go into labor on their own [9].

A greater rate of spontaneous labor was also found by Lamming *et al.,* [8] The current investigation found that headache was the most often experienced adverse event.

Patients in Group A were more likely to experience this symptom than those in Group B, which was 7%.

Drowsiness was more common in methyldopa patients, whereas labetalol patients experienced greater weakness.

Negative reactions were equally common in both groups, including sickness and fatigue.

Verma *et al.,* conducted a study showing that the incidence of adverse events was much lower in the labetalol group compared to the methyldopa group [15].

In a 2012 research, Qarmalawi *et al.,* found that 5.6% of methyldopa patients experienced dizziness when standing, while 14.8% experienced headaches, 7.4% had nasal congestion, and 22.2% experienced sleepiness [9].

There were 6 reports of dyspnea among the labetalol group of patients, but no other adverse events were recorded.

CONCLUSION

Current research indicates that labetalol is superior than methyldopa at lowering blood pressure more quickly and effectively. More people in the labetalol group experienced overwork from an unexpected source than those in the methyldopa group. Absence of adverse effects on mother or baby, potent hypotensive activity, and reduced perinatal mortality in a disease associated with significant fetal loss all point to labetalol's safety for usage during pregnancy.

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