

Efficacy of Labetolol in Women with Pre-Eclampsia at Tertiary Care Hospital of Upper Sindh

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ABSTRACT

Background: When pre-eclampsia (PE) occurs, it is a multi-organ condition with an unknown cause that is classified as a high-risk pregnancy marked by hypertension and proteinuria. Many antihypertensive medications are utilised, but they have drawbacks, whereas the use of labetalol to treat hypertension in women with pre-eclampsia has shown to be effective. Our findings may aid in underlining the importance of adequate treatment for pre-eclamptic patients who are in danger.

Objective: To evaluate the effectiveness of intravenous labetalol in the treatment of pre-eclamptic pregnant women who presented to a public service tertiary hospital.

Study Design: Descriptive study.

Place and Duration of Study: Department of Obstetrics and Gynecology, Shaikh Zaid Women Hospital, Larkana from 1st June to 30th November 2020.

Methodology: One hundred women with pre-eclampsia who had a singleton pregnancy on ultrasonography. Then intravenous labetalol 20mg, 40mg, 80mg, then 80mg every 15 minutes until goal blood pressure was obtained. Every 30 minutes, blood pressure was taken.

Results: The mean age was 31.25±5.30 years. There were 24% patients with pre-eclampsia achieved target blood pressure (150/100 mmHg) with one dose of intravenous labetalol, another 55% achieved target blood pressure with a second dose, and the remaining 21% achieved target blood pressure with a third dose.

Conclusion: Labetalol was found to be an effective treatment for women suffering from pre-eclampsia.

Keywords: Pre-eclampsia, Blood pressure, Intravenous labetalol

INTRODUCTION

In pregnancy, preeclampsia is defined as the presence of pregnancy-induced hypertension and proteinuria of 300 mg/24h or more after 20 weeks of gestation, which falls under the umbrella term "hypertensive crisis."¹ It always poses a risk to foetal life on the one hand, but it also has many morbid consequences for the mother's health as a result of the diverse attacks on other body systems that occur when the situation is not effectively treated. Pre-eclampsia is responsible for complicating approximately 8% of all pregnancies worldwide, with the figure perhaps being greater in developing areas of the world.²

Women with a prior history of pre-eclampsia, chronic hypertension, metabolic problem, pre-gestational diabetes mellitus, pre-existing thrombophilia, or who are already pregnant with multiple children are at significantly higher risk of developing the disease.³ In addition to headaches, visual disturbances, abnormal kidney function, severe hypertension and chest pain, pulmonary edoema and low oxygen saturation, nausea, and abnormal liver function, the multi-organ system dysfunction in PE is associated with foetal growth restriction, reduced amniotic fluid, and foetal distress.⁴

Non-pregnant women who are experiencing pre-eclampsia may have a different aetiology compared to women with pre-existing conditions, past pregnancies, or impaired glucose metabolism. Prior to 34 weeks gestation, patients who have pre-eclampsia may be more serious than those who have it later in the pregnancy or in the postpartum period.⁵

Latency period achieved, utilising robust antihypertensive medicines, can enhance newborn prognosis in severe early-onset pre-eclampsia, in order to prevent maternal issues such as cerebrovascular haemorrhage and organ damage, has been found to be an effective treatment for pre-eclampsia.⁶

In women with severe pre-eclampsia, magnesium sulphate is advised as an antidote to seizures (eclampsia), as well as the first-line pharmacological treatment for seizures. However, there is some debate about the use of MgSO₄ in the treatment of minor illness.⁷ It is possible to take methyl dopa and nifedipine by mouth however these medications tend to be less potent in people with severe pre-eclampsia. Pregnant women on dihydralazine were shown to have a higher rate of maternal adverse effects, as well as

a lower rate of successful births.⁸ There has been a rise in the usage of 5-HT_{2A} receptor antagonist ketanser, although its antihypertensive effect is likewise debatable and requires further treatment. A drop in blood pressure to below 150/100 mmHg is essential to avoid problems.⁹

Laboratoryol, a newer drug, is a combination of alpha and beta blockers that can be taken orally or intravenously. The medicine is administered intravenously at a rate of 10 to 30 mg/h or 50 to 200 mg three times a day. The antihypertensive impact is quickly felt upon intravenous infusion, and the medication's action lasts between four and six hours. 30% of pre-eclampsia patients attained target blood pressure (150/100 mmHg) with one dose, 50% with the second dose, and 20% with the third dose of intravenous labetalol, according to a study published in the Journal of the American Medical Association.¹⁰ Flushing, nausea, and vomiting are the only negative effects of the medicine, which is well tolerated. Through foetal surveillance, one of the most significant risks is newborn bradycardia.¹¹

Antihypertensive therapy options are currently restricted. Labetalol's efficacy in the treatment of pre-eclampsia patients in Pakistan has been studied in a limited number of clinical trials. Pregnant women with critical pre-eclampsia will benefit from this study's recommendations. Therefore, if labetalol is proved to be effective, this study should be carried out.

MATERIALS AND METHODS

This descriptive study was conducted at Department of Obstetrics and Gynecology, Shaikh Zaid Women Hospital, Larkana from 1st June to 30th November 2020 and 100 pre-eclampsia patients were enrolled. Patients between the ages of 18 and 45, either booked or unbooked, have a singleton pregnancy on ultrasound that is more than 24 weeks gestational age. After the agreement of the patients, those with pre-eclampsia were included. There were no participants in the trial who had a history of asthma or congestive heart failure or whose ultrasounds showed a dead foetus were excluded. Women admitted to the department of obstetrics, after receiving approval from the institutional ethics review committee, were included in the study if they met the inclusion criteria. Informed consent was obtained from patients in Urdu/Sindh

language after a thorough discussion of the study's goal and the risks and benefits.

The data was entered and analyzed through SPSS-25. The Chi-square test was used to determine the effect of modifier stratification based on maternal age, gestational age, parity, and body mass index (BMI). If the P value is less than 0.05, it is considered significant.

RESULTS

49% of women under the age of 30 years while 42% women between 31-40 years and mean age was 31.25±5.30 years. The baseline blood pressure is shown in Table 1. Twenty seven (27%) women were single while 73 (73% were in a relationship (Fig. 1). 24% of pre-eclampsia patients achieved target blood pressure (150/100 mmHg) with one dose, 55% with the second dose and 21% with the third dose of intravenous labetalol (Fig. 2). There was no statistically significant correlation between gestational age and parity (Tables 2-3).

Table 1: Descriptive statistics of the patients

Variable	Mean±SD
Age (years)	31.25±5.30
Gestational age (weeks)	34.60±2.61
Weight (kg)	71.33±11.64
Height (cm)	155.59±4.77
BMI (kg/m ²)	29.48±4.70
Parity	1.73±0.44
Base line SBP	160.08±7.48
Base Lin DBP	106.40±6.19
Dose	2.16±0.79

Table 2: Efficacy of intravenous labetalol in treatment of pre-eclampsia according to gestational age (n=100)

Gestational age (weeks)	Dose			χ ²	P value
	1	2	3		
≤ 35	16(26.7%)	33(55%)	11(18.3%)	0.952	0.621
> 35	8(20%)	22(55%)	10(25%)		

Table 3: Efficacy of intravenous labetalol in treatment of pre-eclampsia according to parity (n=100)

Parity	Dose			χ ²	P value
	1	2	3		
Primiparity	3(11.1%)	14(51.9%)	10(37%)	7.156	0.028
Multiparity	21(28.8%)	41(56.2%)	11(15.1%)		

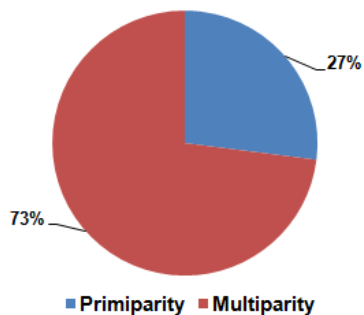


Fig. 1: Parity distribution

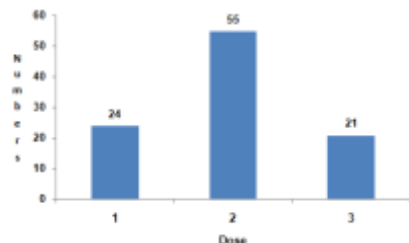


Fig. 2: Efficacy of intravenous labetalol in treatment of pre-eclampsia among pregnant women with respect to dose

DISCUSSION

Pregnancy's hypertensive crisis can lead to a number of syndromes, and this is the condition that needs greater attention. Pre-eclampsia, which can emerge as a new illness or as a complication of chronic hypertension, is the second most important peri-partum cause of morbidity and mortality for both mother and child.^{12,13} We have witnessed an increase in pre-eclampsia patients at our facility since COVID 19 compared to pre-Covid-19 years. Even though they haven't documented many cases, one study reports the same thing.¹⁴ Preeclampsia rates in Karachi and Lahore were 5.34 percent and 3.2 percent, respectively, prior to covid-19.^{15,16}

Low and high-income countries have been found to have different rates of preeclampsia, however the rate is 10-30 times greater for women in lower socioeconomic statuses.¹⁷ When the placenta fails to develop properly, it triggers an inflammatory reaction in the mother, which is exacerbated by the lack of angiogenesis in the placental ducts.¹⁸

It is possible to employ methyldopa, slow-release Nifedipinel, Labetolo, beta blockers (selective), and even diuretics in patients with pre-existing hypertension¹² but the risk of adverse effects must always be taken into account. Pregnant women with high hypertension are also prescribed labetalol. Intravenous labetalol is an excellent first-line treatment for preeclampsia because it blocks both the alpha and beta adrenoceptors.¹⁹

Intravenous labetalol was also tested in our study for its ability to treat pre-eclampsia. With a mean age in the labetotol group of 31.25 years and a standard deviation of 5.30 years, our research shows that early marriages are on the decline. We recruited 100 women regardless of parity who had an ultrasound showing a live singleton pregnancy and a gestational age >24 weeks at recruitment time. Other studies have found that our study's demographic and gestational ages are in line with their findings.²⁰ Primiparous women are more susceptible to pre-eclampsia, which has been referred to as "a sickness of primiparity."¹² According to our research of 100 women, 27% of them were single, while 73% were married. Pre-eclampsia is more common in women who are older, nulliparous, or have many pregnancies, according to a Saudi Arabian study.²¹

We found that 24 percent of pre-eclamptic patients attained goal blood pressure (150/100 mmHg) with one dosage of intravenous labetalol, 55 percent achieved target blood pressure with the second dose, and 21 percent achieved target blood pressure with the third dose of intravenous labetalol. Comparative analysis of labetalol with other antihypertensive medications performed by Magee and his colleagues likewise yielded similar results. Patel et al²² also shows that labetalol is safe. Hydralazine was shown to have a lower compliance rate than labetalol. Khan et al²³ found that labetalol reduced severe hypertension with a p value of 0.046. All studies across the world have focused on the safest and most effective antihypertensive medicines that can minimise maternal and perinatal morbidity and mortality.

CONCLUSION

Labetalol's ability to control blood pressure was astounding, but the selection of patients and the careful administration of the drug mattered greatly in terms of fetomaternal outcomes and Pakistan's socioeconomic indicators. Preventive measures should be taken in antenatal clinics to educate pregnant women with risk factors for hypertension diseases. Maternal and perinatal morbidity and mortality can be reduced through outreach activities in low-literacy areas.

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