

## Labetalol Vs Nifedipine in treatment of Pregnancy induced hypertension



### Gynaecology

**KEYWORDS:** Labetalol, Nifedipine, pregnancy induced hypertension

**Dr. K. Vijya Lakshmi**

Professor Dept. of Obstetrics & Gynaecology Alluri Sitarama Raju Academy of Medical Sciences Eluru-534005, W.G.dist, A.P.

**Dr K Lakshmi**

Final year postgraduate Dept. of Obstetrics & Gynaecology ASRAM, Eluru-534005, W.G.dist, A.P.

### ABSTRACT

**Abstract Objective:** To compare Labetalol with Nifedipine in their rapidity to control hypertension in PIH.

**Design:** A hospital based prospective randomized interventional comparative study. **Methods:** Pregnant woman with gestational hypertension  $\geq 140/90$  mm of Hg were randomized to receive Labetalol (in an escalating dose regimen) or Nifedipine (10mg tab orally) until the target blood pressure was achieved. **Results:** The meantime required to achieve target blood pressure of  $< 140/90$  mm of Hg were in the Labetalol group  $2.9 \pm 1.52$  days and  $4.45 \pm 0.99$  days with nifedipine ( $P < 0.0001$ ) in mild PIH, the mean time required in severe PIH with IV labetalol is  $54 \pm 31.3$  min & with Nifedipine  $87 \pm 22.1$  min ( $P = 0.014$ ). **Conclusion:** Labetalol effective when compared with Nifedipine in controlling blood pressure in pregnancy induced hypertension

### INTRODUCTION:

Women with pregnancy induced hypertensive disorder may progress from mild disease to a more serious (life threatening) condition. If hypertension occurs after 20 weeks of gestation,

during labour and/or within 48 hours of delivery it is classified as pregnancy induced hypertension.<sup>(1)</sup> Hypertensive disorders of pregnancy complicate 5 to 8% of pregnancies and are a major cause of maternal and perinatal morbidity and mortality<sup>(2)</sup> Most clinicians commence antihypertensives if BP is more than 140/90 mm of Hg; some start if BP is more than 170/110 mm of Hg. Treating the hypertension does not alter the progression of disease. However it has been shown that early treatment decreases not only the frequency of hypertensive crisis, but also the rate of neonatal complications. The management of pregnancy induced hypertension is mainly termination of pregnancy, which can not be done in many cases due to preterm by gestational age. It is thus prudent to continue the pregnancy till the stage where in the foetal survival is good. During this period the maternal and foetal conditions are monitored along with control of hypertension by antihypertensive drugs.

Occasionally pregnancy needs to be terminated due to non control of blood pressure, deterioration of maternal or foetal conditions.

Despite years of research, there remains a lack of consensus on what constitutes an appropriate antihypertensive agent in pregnancy, the maternal-foetal risk-benefit analysis of therapy, short and long term maternal-foetal/neonatal adverse effects, as well as cost effectiveness<sup>(3)</sup>. The agents suggested include methyl dopa, nifedipine and labetalol<sup>(4)(5)</sup>. This study compares the efficacy of Nifedipine and Labetalol in control of blood pressure in mild to moderate pregnancy induced hypertension.

### Material and Methods:

One hundred cases of pregnancy induced hypertension were studied during the period of 1 1/2 year (18 months) from March 2015 to October 2016 at the Department of Obstetrics and Gynaecology, ALLURI SITARAMARAJU ACADEMY OF MEDICAL SCIENCES, ELURU.

50% of the cases belong to The Labetalol Group, while the other 50% comprise the Nifedipine Group, selected randomly. Each group comprised a total of 50 cases, 40 of them are Mild PIH cases while the other 10 cases are the cases of severe hypertension, Imminent eclampsia, eclampsia, Placental Abruption etc.

### Criteria for selection of patients

#### Mild Group:

- Women between the age group of 18-45 years
- Patients with gestational age beyond 20 wks
- Patients with blood pressure above 140/90 mm Hg on at least two occasions six hours apart. Or Diastolic Blood Pressure greater than 100 mm Hg at single recording.
- Patients with other associated medical disorders like Diabetes and Heart Diseases are excluded.

#### Severe Group

- Women between the age group of 18-45 years
- Patients with GA beyond 20 wks
- Patients with a blood pressure of 160/110 mm Hg or more
- Patients with Imminent Eclampsia, Eclampsia, Placental Abruption etc with Severe Hypertension.

#### Method of Study

Baseline investigations like Complete Blood Count, Platelet count, Coagulation profile, Renal and Liver functions tests, USG for AFI, BPP and Fundus examination were done before starting the treatment.

Proper history regarding contraindications for the drugs being used was taken.

**Labetalol:** Initial oral doses of 100mg tablets twice a day at fixed timings preferably with food, to achieve a reasonable blood pressure. If the control of blood pressure is not satisfactory even after three days continuous treatment dose increment of another 100 mg twice a day and so on.

In severe Pre eclampsia with blood pressure more than 160/110 mm Hg, I.V Labetalol starting with a 20 mg intra-venous bolus, if not effective within 10 min, this is followed by 40mg, then 80mg every 10 min but not exceeding 220 mg total dose per episode treated.

**Nifedipine:** Oral doses of 10 - 20mg 4 to 6 hours apart at fixed timings. Maximum dose per day is 120mg.

In Emergencies half an hourly oral dose of 10mg tablets repeated until the blood pressure is controlled.

Blood Pressure recorded at 6 hourly intervals in mild group, once in every 5min in severe hypertension group until it is controlled satisfactorily.

The fall in mean BP with both the drugs were compared by calculating P value using paired 't' test. And the time taken to achieve target BP with both the drugs were compared by calculating P value using unpaired 't' test.

Pulse should be counted for complete one minute, character, volume, rhythm were also noted. Patient should be closely monitored for after drug administration for any side effects. Foetal Heart rate was also monitored.

Urine Albumin is measured daily, USG once weekly along with Biophysical profile.

The primary outcome was the time interval required to achieve the targeted BP i.e. systolic BP <140 mm of Hg and diastolic BP < 90 mm of Hg in mild PIH cases &  $1 \leq 150$  mm of Hg systolic,  $\leq 100$  mm of Hg diastolic BP in severe PIH cases... Numerical data obtained were statistically analysed with suitable statistical software. Normally distributed continuous data analysed with student's 't'-test. All tests are two sided and  $P < 0.05$  will be taken as the level of significance.

## RESULTS:

A comparative study consisting of 152 pregnant women, 76 pregnant women with preeclampsia treated with Labetalol (Group A) and 76 pregnant women with preeclampsia treated with Nifedipine (Group B) is undertaken to study the safety & efficacy of the drugs. Both the two groups had comparable demographics and their characteristics are represented in table 1.

Characteristic (range)	Labetalol	Nifedipine
Age Group (15 - 45 yrs)	22±2.62	21.3±4
Primis	35	33
Systolic Blood Pressure (140 - 160) in Mild PIH	146 ± 9.0	148.25 ± 9.6
Diastolic Blood Pressure (80-110) In Mild PIH	96.75 ± 5.26	83.25 ± 5.26
Systolic Blood Pressure ( $\geq 160$ ) in severe PIH	183 ± 23.11	185 ± 12.7
Diastolic Blood Pressure ( $\geq 110$ ) In severe PIH	122 ± 11.35	119 ± 8.76

**Table 3: Comparison of efficacy of labetalol and nifedipine**

Drug name	Labetalol (n=76)	Nifedipine (n=76)	P value
Duration in days in mild PIH	3	4.45	
Mean±SD (d) in PIH	<b>2.95 ± 1.52</b>	<b>4.45 ± 0.99</b>	<0.0001
Duration in minutes in severe PIH	54	87	0.014
Mean±SD (minutes) in severe PIH	<b>54 ± 31.3</b>	<b>87 ± 22.1</b>	

## Comparison between Systolic and Diastolic BP of the two groups

Variables	Labetalol Mean ± SD	Nifedipine Mean ± SD	P value
Systolic BP (mm of Hg) in mild PIH, (n:40)	146 ± 9.0	148.25 ± 9.6	P = 0.048
Diastolic BP (mm of Hg) in mild PIH, (n:40)	96.75 ± 5.26	97.75 ± 6.6	P = 0.002
Systolic BP (mm of Hg) in severe PIH (n:10)	183 ± 23.11	185 ± 12.7	P = 0.022
Diastolic BP (mm of Hg) in severe PIH (n =10)	122 ± 11.35	119 ± 8.76	P = 0.024

## Discussion:

The results of our study are similar to that of a prospective, randomized, open labelled study, conducted by McDonald AJ et al. The pretreatment blood pressure for Labetalol was 195/127 mm Hg

which decreased to 154/100 mm Hg and of Nifedipine was 198/128 mm Hg, alleviated to 163/100 mm Hg ( $P > .2$ ). No significant side effects occurred with either drug. Labetalol is effective when compared to Nifedipine in pregnancy induced hypertensive emergencies [6].

Where as in our study mean systolic pressure fall from 146 ± 9.0 to 126.75 ± 6.11 mm of Hg with Labetalol and from 148.4 ± 9.6 to 129.25 ± 7.5 mm of Hg with Nifedipine.

Mean diastolic Pressure fall from 96.75 ± 5.26 mm Hg to 83.25 ± 5.26 mm Hg with Labetalol and from 97.75 ± 6.6 to 86.75 ± 4.74 mm Hg with Nifedipine, in Mild pregnancy induced hypertension group with P value <0.05.

Fall of mean systolic pressure from 183 ± 23.11 mm Hg to 139 ± 5.68 mm Hg with Labetalol and from 185 ± 12.7 to 142 ± 4.22 mm Hg with Nifedipine.

Fall in diastolic pressure from 122 ± 11.35 mm Hg to 94 ± 5.16 mm Hg with Labetalol where as with Nifedipine it is from 119 ± 8.76 mm Hg to 99 ± 7.38 mm Hg. (P value is  $\leq 0.0001$ ) in severe pregnancy induced hypertension group.

Fall in Blood Pressure is significant with Labetalol compared to Nifedipine as the P value for the blood pressure after the treatment is <0.05 in both mild and severe PIH.

The results of our study are similar to as the study conducted by Harshini et al, in 2014 in comparing the duration of time required for Labetalol to normalize the high blood pressure is 5 days (5 ± 2.63 days), and that of Nifedipine is 7.5 days (7.5 ± 3.83 days) with P value of 0.0015. (7). In our study The mean time taken to achieve target BP were 2.95 ± 1.52 days in Labetalol group & 4.45 ± 0.99 days in the Nifedipine group with the 'P' value of <0.0001 in mild PIH.

In severe PIH the time taken was 54 ± 31.3 min in Labetalol group & 87 ± 22.1 mins in the Nifedipine group with the 'P' value of 0.014 ( $p < 0.05$ ). Labetalol is highly efficacious in the time taken to control BP than Nifedipine to target levels (the P values calculated from unpaired 't' test), compared to study conducted by IA Raheem et al in 2012 that the median time taken to achieve target blood pressure was 30 minutes (interquartile range, IQR 22.5–67.5 minutes) versus 45 minutes (IQR 30–60 minutes) for Nifedipine and Labetalol, respectively (P = 0.59) showing there was no difference between the Nifedipine and Labetalol groups. (8)

**CONCLUSION :** Though Labetalol is more effective and rapid in controlling blood pressure. Both drugs have some advantages and disadvantages as well.

## References

1. Pregnancy Induced Hypertension and its Management D Subedi Department of Midwifery, T U, IOM, Nursing Campus, Maharajgunj, Kathmandu, Nepal Correspondence to: Ms Durga Subedi, Email: durgasubedi2014@yahoo.com.. Journal of Institute of Medicine, December, 2014, 36:3
2. Diagnosis and management of preeclampsia and eclampsia. ACOG Practice Bulletin 2002; 33:1-14.
3. Abalos E, Duley L, Steyn DW, Henderson-Smart DJ. Antihypertensive drug therapy for mild to moderate hypertension during pregnancy (Cochrane Review). Cochrane Database Syst Rev 2007; 24(1):CD002252.
4. National High Blood Pressure Education Program Working Group on High Blood Pressure in Pregnancy. Report of the National High Blood Pressure Education Program Working Group on High Blood Pressure in Pregnancy. Am J Obstet Gynecol 2000; 183(1):S1-22.
5. Rey E, LeLorier J, Burgess E, Lange IR, Leduc L. Report of the Canadian Hypertension Society Consensus Conference: 3. Pharmacologic treatment of hypertensive disorders in pregnancy. CMAJ 1997; 157(9):1245-54.
6. McDonald AJ, Yealy DM, Jacobson S. Oral labetalol versus oral nifedipine in hypertensive urgencies in the ED. Am J Emerg Med 1993; 11:460-3.
7. Harshini et al. COMPARISON OF EFFICACY AND SAFETY OF ORAL LABETALOL AND NIFEDIPINE IN PREECLAMPSIA: A PROSPECTIVE OBSERVATIONAL STUDY CHAVA. JHANSI, MANDALI. YOGYA SREE HARSHINI\*1, KANNEGANTI. SANDEEPI, P. CHANDRASEKHARA RAO2, CH. CHAITANYA LAKSHMI3 I International Journal of Pharmacy and Pharmaceutical Sciences ISSN- 0975-1491 Vol 7, Issue 9, 2015
8. Raheem I, Saaid R, Omar S, Tan P. Oral nifedipine versus intravenous labetalol for acute blood pressure control in hypertensive emergencies of pregnancy: a randomised trial. BJOG 2012; 119:78–85.