ORIGINAL ARTICLE

Role of Hydralazine in the Control of Blood Pressure in Severe Pre-Eclampsia and Eclampsia in Comparison to Sublingual Nifedipine

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ABSTRACT

Objective — *To compare the efficacy and maternal side effects of hydralazine with sublingual nifedipine in controlling blood pressure in severe pre-eclampsia (PE) and eclampsia.*

Study design — *Quasi interventional*

Place & Duration of study — *The study was conducted in the Department of Obstetrics and Gynecology unit II, Bahawal Victoria Hospital (BVH) Bahawalpur, from January 2007 to January 2008.*

Methodology — *A total of sixty patients were divided in two groups of 30 each (group A – hydralazine and group B – nifedipine). All were admitted through emergency. Allocation to each group was random. All patients matched for variables like age, parity, previous history of PE so as to minimize the confounding effects.*

Results — *There were 20 (66.67%) patients with complications in group A and 25 (83.33%) patients in group B (p 0.136). Headache in group A was noted in 7 (35%) patients and in 10 (40%) patients of group B, palpitations reported in 6 (30%) cases of group A and 8 (32%) in group B. Maternal hypotension was found in 6 (30%) patients of group A and 7 (28%) in group B and fetal distress noted in one (5%) patient of group A only. P value in all above complications was >0.005.*

Hospital stay of up to 9 days was observed in 17 (56.67%) patients of group A, and four (13.33%) patients in group B. Patients who stayed 9-12 days were 12 (40%) in group A and 18 (60%) in group B, while the longest stay at hospital (12-15 days) was found in one (3.33%) patient of group A and 8 (26.67%) patients in group B. There was no patient who was admitted for more than 15 days in both the groups.

When time taken to control BP was compared, one hour was observed in 15 (50%) patients in group A and 5 hours in 5 (16.67%) patients in group B after initial dose of both hydralazine and sublingual nifedipine respectively. Ten (33.33%) patients took 2-3 hours in group A and 16 (53.33%) patients in group B after 2nd dose. Total 4-5 hours time interval was observed in 5 (16.6%) patients in group A and in 9 (30%) patients of group B after receiving 4th dose.

Conclusions — *Hydralazine was significantly more effective in controlling blood pressure (BP) after administration of its initial dose, thus reducing the total dose of drug given and had better outcome of mother and fetus, with reduced hospital stay as compared to sublingual nifedipine.*

Key words — *Hydralazine, Sublingual nifedipine, High blood pressure, Eclampsia*

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INTRODUCTION:

Severe pre-eclampsia and eclampsia are important causes of maternal and fetal morbidity and mortality worldwide.[1] In the developed world maternal deaths associated with hypertensive disordersof pregnancy

have come to occupy first place. In under developed world also they are the leading causes of maternal deaths along with hemorrhage and sepsis. The reported maternal death rate due to these disorders in these countries vary from 10-45/100,000 total births with proportion of death due to eclampsia ranging between 60-100% suggesting that around 10% of all maternal deaths (50,000 per year worldwide) are associated with eclampsia. Moreover it can also result in severe morbidity due to cerebral hemorrhage, cortical blindness, renal failure, DIC, pulmonary edema and psychosis. Infants born to eclampsia mothers are commonly growth retarded, born preterm or at term.[1] Therefore vigilant antenatal care is required for timely management. All pregnant women should have their blood pressure (BP) checked and clean catch mid-stream sample of urine tested, for presence of proteinuria with dip stick.

The aim of lowering BP is to minimize the risks to the mother from events such as cerebral hemorrhage, cardiac failure, myocardial infarction and placental abruption. Treatment must induce a smooth sustained fall in the BP, rather than an acute drop, which is dangerous both to the mother and to the fetus. The aim of the therapy is to gradually lower the BP by 10 mmHg systolic and diastolic from pre treatment levels and maintain the mean arterial pressure below 125 mmHg (but not less than 105mmHg) and the diastolic BP below 105 mmHg (but not less than 90 mmHg).[1-6]

Hydralazine is the most widely accepted drug to treat hypertension in PE and eclampsia. Hydralazine is a direct vasodilator and selectively relaxes arteriolar smooth muscle by an unknown mechanism.[7] It is effective orally, intramuscularly, or intravenously. It is given intermittently as a bolus to patients. Nifedipine is a calcium channel antagonists. It is administered at an initial oral dose of 10 mg, which may be repeated after 30 minutes, as needed to a maximum dose of 50 mg.[7] Sublingual use of nifedipine may be associated with maternal hypotension and fetal distress. This study was conducted to find out the efficacy and maternal side effects of hydralazine in comparison with sublingual nifedipine in controlling blood pressure in severe pre-eclampsia and eclampsia.

METHODOLOGY:

All patients admitted to Obstetrics & Gynaecology Unit II of Bhawal Victoria Hospital Bahawalpur, from January 2007 to January 2008 with severe PE and eclamptic seizures (antepartum, intrapartum and postpartum seizures) were included. Patients with hypersensitivity to hydralazine and nifedipine, mitral valve rheumatic heart disease and acute myocardial infarction were excluded.

Patients/attendants were informed about the study and verbal consent taken. They were divided in two groups, group A (hydralazine group) and group B (nifedipine group). Patients treated with hydralazine were given 5-10 mg dose as an IV bolus with dosage interval not less than every 20 minutes until BP was controlled. Blood pressure was monitored every 2-5 min. The goal was to decrease the diastolic BP to 90-100 mmHg. The side effects like headache, restlessness, palpitation and hypotension were looked for. For preventing fetal distress preloading of the circulation was done with 400 ml colloid and use of small (5 mg) boluses of drug. Nifedipine was given as an initial dose of 10 mg sublingually, every thirty minutes as needed to a maximum dose of 50 mg. BP was monitored continuously.

A record of the particulars of every patient was maintained. The time interval since the start of therapy until BP controlled, total dose of drug administered and occurrence of any side effects were recorded. Total duration of hospital stay was also noted. The complications, if any faced during control of BP, were managed accordingly. Data were analyzed using computer software SPSS version 10. Percentage was calculated to know the statistical significance of difference between two groups. The Chi square test was used for qualitative variables like side effects. For quantitative variables like hospital stay and duration of control of blood pressure the Student t test was applied. The level of statistical significance á (alpha) was taken as 0.05.

RESULTS:

A total of sixty patients were managed, equally divided in 2 groups of 30 each. Nineteen (63.33%) patients in group A (hydralazine) and sixteen (53.33%) patients in group B (nifedipine) were less than 20 years of age. Mean age was 22.97 years with p value of 0.831. Primigravida were 17 (56.67%) in group A and 18 (60%) in group B (p 0.793). The distribution of patients according to their gestational age at presentation with severe pre-eclampsia and eclampsia was 20-25 weeks in 8 (26.67%) patients in group A and 7 (23.33%) patients in group B. Women with more than 25 weeks gestation were 22 (73.33%) in group A and 23 (76.67%) in group B. The mean gestational age was 26.90 ± 3.71 weeks in group A and 27.17 ± 3.47 weeks in group B (p 0.77).

Maternal morbidity, maternal complications, hospital aternal morbidity, maternal complications, hospital s tay and time taken to control BP are shown in t able I, table II, table III and table IV respectively.

Table I: Distribution of Cases According to Maternal Morbidity

Morbidity	Hydralazine (n=30)		Sublingual Nifedipine (n=30)	
	(n)	%	(n)	%
With complications	20	66.67	25	83.33
No complication	10	33.33	05	16.67
Total	30	100	30	100

P value (0.136= >0.005)

Table II: Distribution of Cases According to Maternal Complications

Complications	Hydralazine (n=20)		Sublingual Nifedipine (n=25)		p value
	(n)	%	(n)	%	
Headache	7	35	10	40	0.731
Palpitations	6	30	8	32	0.885
Maternal hypotension	6	30	7	28	0.883
Fetal distress	1	5	-	-	

Table III: Duration of Hospital Stay

Stay (days)	Hydralazine (n=30)		Sublingual Nifedipine (n=30)		p value
	(n)	%	(n)	%	
Up to 9 days	17	56.67	4	13.33	0.002
9-12 days	12	40	18	60	0.143
12-15 days	1	3.33	8	26.67	0.001

Table IV: Status of Doses and Time Taken to Control Blood Pressure

Doses	Time taken to control BP (hours)	Hydralazine (n=30)		Sublingual Nifedipine (n=30)		p value
		(n)	%	(n)	%	
After initial dose	1	15	50	5	16.67	0.006
After 2nd dose	2-3	10	33.33	16	53.33	0.118
After 3rd dose	4-5	5	16.67	9	30	0.222

DISCUSSION:

Pre-eclampsia is characterized by development of hypertension, proteinuria or both after 20 weeks of gestation in a woman with previously normal BP. PE complicates 3-5% of first pregnancies and 1% subsequent pregnancies.[8] Eclampsia is characterized by generalized tonic-clonic convulsions that develop in some women with hypertension induced or aggravated by pregnancy.[9] Eclampsia complicates approximately 1 in 2000 pregnancies in developed countries, while in developing countries incidence varies between 1 in 100 to 1 in 1700.[10] There are many predisposing factors for pre-eclampsia/eclampsia. It is more common in primigravida under the age of 20 years or over 30 years.[9]

The age distribution of the cases showed that maximum number of patients in our study was less than 20 years of age. The incidence increases

sharply after 45 years and then remains more or less static after 55 years. These values are comparable with the age distribution and incidence in other studies.[11] In present study 63.33% of the pre-eclamptic and eclamptic women were < 20 years of age and 16.67% above 31 years. It was evident from the study that maternal age has a strong association with frequency of PE and eclampsia. It is most common in young age below 20 years, and then it became less frequent between 31-40 years. This was in accordance with other studies carried out by Chen CY and Shaheen B et al.[12,13]

In this study primigravida were more than multigravida but it was statistically insignificant. Another study by Shaheen B et al from Peshawar also supports the high incidence of pre-eclampsia and eclampsia in primigravida.[13] In our study, the patients of pre-eclampsia and eclampsia were found to be between 25-28 weeks of gestational age at presentation. The mean gestational age was 26.90 ± 3.71 weeks in group A and 27.17 ± 3.47 weeks in group B. A study conducted at Nishtar hospital, Multan also showed that eclampsia mostly occurred after 28 weeks of gestation.[14]

In the current study, maternal complications due to the use of hydralazine were headache in 7 (35%) patients and palpitations in 6 patients, while with sublingual nifedipine there were 10 (40%) patients with headache and 8 (32%) patients with palpitations. As regards to the time taken to control blood pressure, group A patients response was quick as compared with group B. The duration of patients' hospital stay in group A was less as compared to patients in group B.

CONCLUSIONS:

Hydralazine is the drug of choice, as it is easy to administer and effective in controlling blood pressure with minimum morbidity. The use of hydralazine is more beneficial with low risk to fetus.

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