COMPARISON OF ORAL NIFEDIPINE WITH INTRAVENOUS HYDRALAZINE FOR ACUTE HYPERTENSIVE EMERGENCIES OF PREGNANCY

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ABSTRACT

Objective: To compare oral nifedipine with intravenous hydralazine in their rapidity to control hypertensive emergencies of pregnancy.

Methodology: It was a comparative study, done in Gynae C unit, Lady Reading Hospital, Peshawar. The study included hundred patients with severe gestational hypertension ≥160/110 mmHg, randomly assigned to two groups (one given intravenous hydralazine and the other oral nifedipine) to achieve a blood pressure (BP) of ≤150/100 mmHg. BP was measured every 15 minutes for one hour. Side effects were noted in terms of maternal headache and hypotension and fetal heart rate.

Results: Both drugs controlled BP in the given time period but hydralazine was more efficacious in terms of time and doses. The time required by hydralazine was 41.10±20.286 minutes as compared to nifidipine was 57.90±21.855 with a significant p value of 0.000. Few doses were required to control BP in case of hydralazine 2.74±1.35 as compared to nifidipine which was 3.86±1.45 with a significant 'p' value of 0.000.

Conclusion: The use of either hydralazine or nifidipine controlled BP in the target time period but hydralazine was more efficacious.

Key Words: Blood pressure, Gestational hypertension, Hydralazine, Nifedifine

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INTRODUCTION

Acute Hypertension in pregnancy is defined as a systolic blood pressure of 160mmHg or a diastolic blood pressure of more than 110mmHg. It is a serious condition which may lead to severe morbidity and mortality. Severe preeclampsia and eclampsia are responsible for 25% of maternal death in developing world.

The most common cause of maternal mortality from hypertensive disease in pregnancy is the Intracerebral haemorrahage as revealed in the most recent Triennium in the UK series(1997-9)[1].

The most commonly used antihypertensives to control acute hypertensive crises in pregnancy are intravenous hydralazine, labetalol and short acting orally administered nifidipine especially in patients who may require emergency caesarean section and those who often receive magnesium sulphate. Three of these antihypertensives have their pros and cons[2-4].

There are many meta-analyses on the subject but there is no consensus about the drug of first choice of treating severe hypertension in pregnancy. More data from large studies will be needed[2].

The purpose of our research was to compare I/V hydralazine with oral nifedipine in regard to efficacy and safety in controlling the blood pressure.

METHODOLOGY

This was a prospective, comparative study done from November 2014 to November 2015 in the Department of Gynae & Obstetrics, Lady Reading Hospital, Peshawar. The study included hundred patients. The purpose of the study was explained to the patients and written informed consent was taken. Inclusion criteria were: (1) patients with systolic blood pressure (SBP) 160 and or above and/or diastolic blood pressure of 110mmHg and or above, (2) singleton pregnancy, (3) gestational age 20 weeks and more, (4) patients with or without proteinuria, (5) no contraindication to the use of hydralazine or nifidipine. Those patients having history of cardiac arrythmias, cardiac failure, wheezy chest, and hypersensitivity to either nifedipine or hydralazine were excluded from the study.

Patients were randomly assigned to 02 groups. One

group received oral nifedipine 10 mg (up to five doses) and second group received intravenous hydralazine injection (in a dose regimen of 5mg I/V, every 15 minutes upto five doses) to achieve the desired BP of ≤150/100 mmHg. The 100 patients included in the study inthe two groups were similar for maternal age, gestational age, gravidity, systolic blood pressure and diastolic blood pressure.

B.P was measured every 15 minutes for one hour and 15 minutes. Once B.P was <150/100 mmHg no further trial medication was given. After BP was controlled, then routine antihypertensives were started after 2 hours of achieving target BP.

Side effects were noted in terms of fetal heart rate and maternal headache and hypotension.

The study was approved by ethical committee of hospital. Statistical Analysis was performed by applying the SPSS Version 12; the Independent "t" test was applied to calculate the 'p' values.

RESULTS

The systolic BP was 182.0±19.48 and 182.2±18.87 in hydralazine and nifedipine group respectively with a p value of 0.959 and diastolic BP was 122±8.571 and 120±7.11 with a p value of 0.376 in the two groups in the same order as given in table1.

The time needed in minutes to achieve desired BP was 41.10±20.286 in hydralazine group which showed a rapid control of BP as compared to nifedipine with a time of 57.90±21.855 with a significant 'p' value of 0.000 as shown in table 2.

Less doses were needed to achieve the desired BP in the hydralazine group 2.74±1.35 as compared to nifedipine group 3.86±1.45 with a significant 'p' value of 0.000 as shown in table 2.

Adverse maternal and fetal effects are shown in table 3. In the nifedipine group one patient had FHR abnormal and delivery was expedited in these cases, none of the patients developed hypotension and 5 patients had headache. The p value of the adverse effects was calculated and was found out to be non-significant as shown in table 3.

DISCUSSION

Hypertensive crises in pregnancy are associated with increased risk of stroke. Therefore lowering of BP is considered of utmost importance in these patients. Although existing research is mostly focused on parenteral antihypertensives but in resource limited settings oral agents can also be used.

The results shown in our study were similar to the meta-analysis done by Magee et al[6,7]. NHEBP has regarded hydralazine as the drug of choice[5]; with long

Table 1: Demographic data of patients

Variables	Hydralazine	Nifidipine	P value
Maternal Age (years)	25.2±4.68	25.1±5.11	0.871
Gestational Age (weeks)	36.2±1.65	36.0±1.34	0.552
Gravidity	2.3±1.32	2.7±1.56	0.217
Systolic BP	182.2±18.87	182.0±19.48	0.959
Diastolic BP	120.6±7.11	122.0±8.571	0.376

Table 2: Efficacy parameters of Intravenous hydralazine versus oral nifedipine in blood pressure control (n=50)

Variable	Hydralazine Mean ± SD ratio	Cap Nifidipine Mean± SD ratio	P Value
Time in Minutes	41.10±20.286	57.90±21.855	0.000
No. of Doses	2.74±1.35	3.86±1.45	0.000

Table 3: Adverse maternal and fetal effects

Side effects		Hydralazine (n=50)	Nifidipine (n=50)	P value
Maternal	Hypotension	2	0	NC
	Headache	3	5	0.460
Fetal	Fetal distress	3	1	0.307

*Not Calculated

experience of safety and efficacy.

Hydralazine has the advantage that its easily given in the unconscious, semi-conscious eclamptic and restless patients whereas this is not possible with nifedipine in such cases.

Duley et al[8] conducted a meta-analysis that included 24 randomized trials and found that the data was insufficient for final conclusions of comparative effect of antihypertensive agent and that the choice of antihypertensive agents should depend on the familiarity of the adverse effects of the drug, and this conclusion was also reached by Noronha-Neto et al[9] in their study.

Nifedipine controls the acute hypertension and preterm labour in pregnancy effectively. Few case reports of use of nifedipine with magnesium sulphate have reported transient neuromuscular weakness[10]. In this study it was found out that nifedipine is an effective drug for control of BP in acute emergencies as the time and number of doses to achieve target BP was in the given time limit. The effectiveness of nifedipine has also been supported by Shekhar et al, Raheem et al, Rezaei et al, in their individual studies[10-12]. In our study no significant maternal or fetal adverse effects were shown in both groups and same results were shown in other studies done by Vermillion et al[13].

CONCLUSION

Our statistical data support the use of either hydralazine or nifedipine for BP control in acute hypertensive emergencies in pregnancy with hydralazine being more effective and side effects being non-significant.

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CONTRIBUTORS

SS conceived the idea, planned the study, and drafted the manuscript. SY helped acquisition of data and did statistical analysis. GA drafted the manuscript and critically revised the manuscript. All authors contributed significantly to the submitted manuscript.