

**A COMPARATIVE STUDY OF SUB-LINGUAL
NIFEDIPINE AND TOPICAL NITROGLYCERINE
DURING THE PERIPARTUM PERIOD IN PATIENTS
WITH SEVERE PRE-ECLAMPSIA.**

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SUMMARY

This study consisted of ninety patients with severe pre-eclampsia. They were divided into 3 groups. Group I (Control group) received hydralazine orally. Group II (nifedipine group) received hydralazine orally and sub-lingual nifedipine. Group III (nitroglycerine group) received hydralazine orally and topical nitroglycerine.

A significant reduction in mean arterial pressure was observed in patients of both nifedipine and nitroglycerine group. The topical nitroglycerine was more effective in treating hypertension associated with severe preclampsia in the peripartum period.

INTRODUCTION

The increase in blood pressure in pre-eclampsia appears to be secondary to generalized arterial vasospasm (Roberts JM, 1989). Hydrallazine is a drug of choice for management of hypertension in Great Britain and U.S.A. and most authorities recommend the control of diastolic B.P. < 110

mm Hg (Symonds EM, 1980; Pritchard JA 1980). The parenteral preparation of hydrallazine is not available in India and the oral hydrallazine has delayed effect on control of B.P. so supplementation of some other anti-hypertensive agent (calcium channel blockers or nitroglycerine) becomes necessary.

Nifedipine a dihydropyridine derivative is a calcium channel blocker with a potent peripheral arterial vasodilatation, effect

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(Ferlinz J, 1986). Bertel, and Conen, (1985) found that Nifedipine is associated with 25% reduction in systolic B.P., diastolic B.P. and mean arterial pressure in 98% of cases.

Nitroglycerine (NTG) relaxes venous smooth muscle in low doses and arterial smooth muscle in high doses (Zacharies et al. 1993). Nitroglycerine has been used by transdermal, intranasal routes in attenuating the haemodynamic response to laryngoscopy and intubation (Kamra, et al 1986). There is no published report on use of NTG ointment for treatment of hypertension in pre-eclampsia patients.

The present study was undertaken to compare the effect of topical NTG and sublingual nifedipine for treatment of

hypertension in severe pre-eclampsia patients.

MATERIAL AND METHODS

Ninety patients with severe pre-eclampsia were admitted in Obstetric Ward of J.N. Medical College, A.M.U., Aligarh. Severe pre-eclampsia was diagnosed based on the criteria in Table I (Cunningham, et al 1989).

Group I (Control group) - received hydralazine 25 mg orally six hourly. If not responding to the above mentioned dose, the dose of hydralazine was increased as required to maintain the diastolic B.P. <110 mm Hg.

Group II (Nifedipine group) - received hydralazine 25 mg orally every six hourly supplemented with sublingual nifedipine

TABLE I

Abnormality	Mild	Severe
Diastolic B.P.	100 mm Hg	110 mm Hg or
Proteinuria	Trace to 1+	Persistent 2+ or more
Headache	-	+
Visual disturbances	-	+
Upper abdominal pain	-	+
Oliguria	-	+
Convulsions	-	+ (eclampsia)
Serum creatinine	Normal	Elevated
Thrombocytopenia	-	+
Hyperbilirubinemia	-	+
Liver enzyme elevation	-	+
Fetal growth retardation	-	+
Pulmonary edema	- +	

The patients were randomly divided into three groups each consisted of thirty patients.

10 mg when diastolic B.P. is > 110 mm Hg.

Group III (Nitroglycerine group) - received hydralazine 25 mg orally every six hourly supplemented with 30 mg topical nitroglycerine (5 cm of 2% NTG ointment).

Maternal pulse and B.P. and fetal heart rate were recorded every 15 minutes in delivery ward, till the first 48 hrs of delivery.

RESULTS

There was no significant difference in different groups with respect to maternal age, gestational age, gravidity and mode of delivery.

The fall in blood pressure in group I patients was observed in 1-2 hours after drug administration while in group II and III the fall was observed in 10-20 minutes after drug administration (Table II)

In this study, the patients with satisfactory level of B.P. after 24 hrs of antihypertensive therapy were 9 (30%) in group I, 18(60%) in group II and 20 (66.67%) in group III. After 48 hrs. of antihypertensive therapy, the number of patients with satisfactory level of blood pressure were 16 (53.33%) in group I, 26(86.66%) group II and 27 (90%) in group III. (Table III)

TABLE II
ONSET TIME OF ANTIHYPERTENSIVE DRUGS
IN DIFFERENT GROUPS

Groups	Onset Time (min.)
I	60 - 120
II	10 - 20
III	10 - 20

TABLE III
PATIENTS WITH CONTROLLED B.P. AFTER ANTI-HYPERTENSIVE
THERAPY

Groups	Patients with controlled B.P.	
	After 24 Hrs.	After 48 Hrs.
I	9(30%)	16(53.33%)
II	18(60%)	26(86.66%)
III	20(66.67%)	27(90%)

DISCUSSION

Hypertension during pregnancy affects the fetus adversely (Braid 1977, Naeye and Friedman 1979). Early control of B.P. in pre-eclamptic toxemia is most important, because this may lead to eclampsia, cerebrovascular accidents and pulmonary oedema. Intravenous hydralazine is the drug of choice for control of B.P. in these patients but parenteral form of this drug is not available in our country.

Gastric emptying time is prolonged during pregnancy and especially during labour (Cunningham et al 1989). Davison et al. 1970 found that gastric emptying time of a watery meal is prolonged by approximately 60% from the 34th week onwards. Therefore, the action of oral antihypertensive drugs may be unpredictable, so alternative routes (sub-lingual, topical) were chosen in this study for the quick onset of drug and well-sustained maintenance of B.P. in severe pre-eclamptic patients.

Raman and Mukherjee 1994 observed a marked fall in B.P. in 20-30 min of administration of Nifedipine (10 mg) sublingually and orally every 8 hours in pre-eclamptic patients.

In our study the onset time of sublingual nifedipine and topical NTG was 10-20 min. A satisfactory control of B.P. was observed in 60% after 24 hrs. and 86.66% after 48 hrs in Nifedipine group and 66.67% after 24 hrs and 90% after 48 hrs in NTG group as compared to control group (oral hydralazine) in which it was 30% after 24 hrs and 53.33% after 48 hrs. Mitra et al in 1992 reported 53% fall after 24 hrs and 71% after 48 hrs of administration

of S/C Nifedipine (10 mg). Other studies reported that Nifedipine is associated with 25% reduction in systolic B.P., diastolic B.P. and mean arterial B.P. in 98% of cases (Houston 1986, Houston 1987).

CONCLUSION

It was concluded that sublingual nifedipine and topical NTG are simple, effective and comfortable means to treat hypertension in severe pre-eclamptic patients.

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