Use of Nifedipine and low dose Magnesium Sulphate in PIH

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Summary: **Pregnancy induced hypertension constitutes important cause of maternal morbidity and perinatal mortality, the pathophysiology of which is ill understood. Nifedipine and low dose Magnesium Sulphate seems to be quite promising. Study of 145 cases receiving the above drugs was carried in Department of Obst. & Gyne. MGIMS, Sewagram revealed distinct relationship between basal B.P. and range of fall of B.P. after medication. Higher the B.P., more is the fall. Mean fall of 25.37/18.12 mm Hg of systolic and diastolic B.P. was recorded. Combination was found effective. None required induction before term due to PIH. There was no side effects in mother and fetus, there was decreased maternal morbidity and perinatal mortality.**

Introduction

Pregnancy induced hypertension (PIH) constitutes the major part of maternal morbidity and mortality as well as perinatal mortality. As the pathophysiology of PIH is ill understood the management by antihypertensive drugs is not clear. The calcium channel blocker "Nifedipine" has been used by many workers and seems to be quite promising. It increases the placental blood flow through vasodilatation as well as decreases blood pressure. (Parulekar 1993). The drug magnesium sulphate is well known to have favourable effects of lowering blood pressures in eclamptic patients.

Its use in eclampsia is well established as it prevents convulsions by acting on neuromuscular junction, and reduces intracranial tension. At the same time it increases the uteroplacental blood flow and oxygen supply to fetus (Duley 1995).

The study was carried out to observe the efficacy of the use of nifedipine and addition of low dose magnesium sulphate in management of PIH, prevention of eclampsia and improvement of fetal outcome.

Material and Methods :

The study includes 145 cases of mild to severe hypertension in pregnancy admitted for treatment in the Department of Obstetrics and Gynaecology, MGIMS, Sevagram. The cases were divided into three groups of mild, moderate and severe. Mild cases included all those where systolic B.P. was in range of 140-149 mm Hg and diastolic was of 90-99 mm Hg. Moderate cases had B.P. of systolic and diastolic of 150-159 mm Hg and 100-109 mm Hg respectively. Severe cases included those with systolic pressure 160 mm Hg or more and diastolic 110 mm Hg. or more.

After checking the B.P. in all the cases 1 mg. Nifedipine was administered sublingually. Injection Magnesium Sulphate was given to all the cases after judging the severity. In mild cases 2 gm. Magnesium sulphate was given IM 8 hourly and in severe cases 4 gm. IM 6 hourly till fundoscopy changes reverted to normal and cases showed no albuminuria. Nifedipine was continued till delivery.

Observations and Discussion :

The analysis of age (Table 1 showed that maximum ie 85 cases (58.6%)) were of age group 21-25 years. There were 12 cases of age group of 33 years and above. Similar observation was made by, Chesley (1978)), Dhall et al (1983)) and Raman Mukherjee (1994) . We found 8.3% cases in age group of 33 years above.

Table I.
Age wise distribution of cases (N = 145).

Age (Yrs)	No.of Cases
15-20	29 (20.0%)
21-25	85 (58.6%)
26-32	19 (13.1%)
33 and above	12 (8.3%)

Table II
Parity Distribution (N = 145)

No. of cases		Percentage
Primis	92	62.75
Multi	32	22.06
P & above	22	15.21

Table III.
Gestation and Pretreatment B.P.

Gestation (in wks)	Mild	Moderate	Severe	Total (%)
<28	-	01	02	03 (2.0)
28-34	06	13	14	33 (23.0)
35-37	07	07	07	21 (14.5)
>37	18	44	26	88 (60.5)
Total	31	65	49	145

Table IV.
Reduction of Systolic B.P.

Range of Fall post T/T (MMHG)	Pre T/T B.P. MM/HG.			
	140 (N=64)	150 (N=30)	160 (N=30)	>160 (N=21)
10	51	20	07	-
20	11	06	10	01
30	02	04	13	06
40	-	-	-	10
> 40	-	-	-	04

Parity distribution is shown in Table II. Fiftyfour cases (37.33%) were multiparous and none of them had previous history of PIH. This study stresses the fact that parity had no role in genesis of PIH. Table III shows the pretreatment blood pressure and gestation period. 60.5% showed PIH in gestation period of more than 37 weeks followed by 23% in 28-34 weeks gestation.

Clinical examination of cases showed that 20% cases had no oedema, 20% had minimal oedema and 60% gross oedema. Proteinuria was present in 4.3% of cases. But, 90% out of these had no proteinuria after one week of

Table V.
Reduction of Diastolic B.P.

Range of fall B.P. (mm/HG)	Pre T/T Diastolic B.P. in MM/HG				
	90 (N=15)	100 (N=44)	110 (N=34)	120 (N=38)	>120 (N=13)
10	15	26	12	05	-
20	-	12	10	05	03
30	-	06	08	14	-
40	-	-	04	14	02
>40	-	-	-	-	08

Table VI
Fundoscopic Changes
(N = 145)

	WNL	GR. I	GR. II	GR. III
Mild	24	5	-	02
Moderate	39	19	06	01
Severe	30	10	05	04

Table VII
Complete Response (in days)

	1st day	2nd day	3rd day	Total
No. of mild cases	06	03	18	27
No. of moderate cases	14	21	25	60
No. of severe cases	05	09	20	34

treatment. On Obstetrical examination 100% cases had multiple pregnancy.

In 20% cases serum urea was 26-46 mg% while in the rest it was 15-25 mg%. Only 10 cases had raised creatinine level upto 1.1 to 1.6 mg%.

In our study there was fall of B.P. within 20-30 minutes ranging from 10-20 mm Hg in mild to moderate cases on first day of treatment. But this fall was maximum (ranging from 30-40 mm Hg)) in cases of severe PIH where B.P. was 160/120 mm Hg. (Table IV, V).

Fundus was normal in 93 cases: of these 30 had severe PIH. Grade III hypertensive retinopathy was seen in 7 cases (Table - VI). With treatment Grade III retinopathy reverted to Grade I and Grade I & II reverted to normal within 3-5 days of treatment. Thus in all these cases

magnesium sulphate was omitted and nifedipine continued (Table VII).

In all cases urine albumin reverted to traces or normal within one week.

In this study, 16 cases of severe PIH were detected at 28-34 weeks of gestation. Out of these 16, 6 cases required repetetion of magnesium sulphate at 32 weeks of pregnancy as there was appearance of albuminuria. But all cases continued pregnancy till term. Two cases required LSCS while the rest delivered vaginally.

All the cases were followed till delivery with monitoring of their B.P. and fetal growth. 75% of these cases delivered vaginally out of which 2% were forceps deliveries. LSCS was done in 25% of the cases; 10% had fetal distress and CPD. Out of 145 cases neonatal losses were 3 and 2 cases were of IUD at the time of admission before treatment was begun. No cases had eclampsia or failure of response. Mild headache was present in 10% cases while 5% had tachycardia.

It was seen that there was a distinct relationship between basal B.P. and range of fall of B.P. after medication. The higher the B.P. more is the fall. However, hypotension was not observed irrespective of dose of drug. With regard to fall of B.P. our cases had mean fall of B.P. our cases had mean fall of B.P. of 25.37 / 18.12 mm Hg systolic & diastolic which is comparable with study of Jain et al (1987)), Kulshreshtha, et al (1989) and Raman and Mukherjee (1994).

With the combination drug thereby acceptable range of fall of B.P. was observed upto third day in all cases. Rapid fall in B.P. is comparable to study of Walters and Radmen (1984), Jain et al (1987).

None of the case progressed to eclampsia. Though in the present study there were 2% of cases below 28 wks who progressed till term with normal fetal outcome.

In the present series 2 cases of PIH with IUD and 2 cases of gestational diabetes with preterm labour accounted for 4 perinatal losses. Rest attained maturity and delivered. None required induction before term due to PIH.

Combination of nifedipine and magnesium sulphate appears to be effective and administrable hypotensive agent in PIH. Low dose magnesium sulphate had no side effects in mother and fetus.

The study supports effectiveness & advantages of the combination therapy in cases of PIH resulting in better perinatal outcome and decreased maternal morbidity and mortality.

Conclusion

Nifedipine and magnesium sulphate in low doses in cases of PIH definitely relieves the obstetrician's dilemma in management of PIH and helps in preventing maternal morbidity and mortality as well as perinatal mortality.

References :

1. Chesley. L.C. Appleton. Century Graft, 1st Ed. New York: 427:1978
2. Cunningham FG, MacDonald PC, Gant NF: Hypertensive disorders in pregnancy. In Williams Obstetrics 18th Ed. P 653 Appleton and Lange. East Norwalk, 1989.
3. Dhall K. Jain S. and Bhatia K : J. Obst. Gyn India : 33:82:1983
4. Duley Lelia: Lancet 345: 1455-1995.
5. Jain S. Nagar S, Sehgal V, Gupta S, Sangetta and Kumari's J. Obst Gyn India : 37:793, 1987.
6. Kulshreshtha S.: Gupte U, Mukherjees and Mehta VL : J. of Obst Gyn India : 39:342, 1989.
7. Parulekar S.V. Practical Gynecology & Obstetrics 2nd Ed. Vora Pub. 134, 1993.
8. Raman Nidhi & Mukherjee K : J. Obst. Gyn India : 44, 25, 1994.
9. Walters B. N. J. & Redman C. W. G : Brit J. of Obst & Gyn. 91, 330, 1984.