Management of Eclampsia with Magnesium Sulphate and Nifedipine

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Summary

For control of convulsions, Magnesium Sulphate ($MgSO_4$) is used world wide. The drug Nifedipine has proved to be an effective antihypertensive agent.

Among 8270 deliveries between April 1993 to March 1997 at MGIMS, Sevagram there were 120 eclampsias, giving the incidence of 1.45%. The efficacy of $MgSO_4$ and Nifedipine was analysed in 60 cases with control of 60 cases who were given $MgSO_4$ and sedation. The perinatal loss in the study group and control group was 5.86% and 50% respectively.

Our study of $MgSO_4$ and Nifedipine regime could safely allow eclampsia patients to continue pregnancy till acceptable survival of the baby and have safe and healthy maternal and fetal outcome.

Introduction

The drug Magnesium Sulphate ($MgSO_4$) is used in eclampsia for controlling convulsions worldwide. It does not cause maternal and fetal respiratory depression and probably enhances uterine blood flow. (Pritchard JA and Pritchard SA 1975). It is believed that $MgSO_4$ has got beneficial effect on neonates (Rudnicki et al, 1994). According to Pritchard & Pritchard (1975), hydralazine was the drug of choice in management of pregnancy induced hypertension (PIH), but it causes pronounced tachycardia and often serious hypovolemia following the delivery with this drug. The drug Nifedipine has proved to be an effective antihypertensive and possesses tocolytic activity in higher doses (Read and Weilby 1986). Nifedipine causes significant vasodilatation in the uterine arteries (Pirhonen et al, 1990). In a retrospective analysis of 120 cases of eclampsia between 1993 and 1997 at MGIMS, Sevagram, it was found that many cases had been treated with magnesium sulphate without an attempt to control blood pressure with hypotensive drugs. To find out the efficacy of addition of Nifedipine the cases were grouped and analysed.

Materials and Methods

The cases were grouped as A and B. Group A were the cases who received nifedipine along with Magnesium sulphate. Group B received Magnesium sulphate and sedation. There were total of 120 cases whose analysis of age, parity, BP, number of convulsions, maternal and fetal outcome was done. These cases were 75% from rural and 25% from urban areas. There were 8270 deliveries during the study period making the incidence of eclampsia to be 1.45%.

All the cases of Group A were administered $MgSO_4$, 4 gm IV (20 ml of 20%) slowly over 3-4 minutes followed by 5 gm (10ml of 50%) solution of $MgSO_4$ IM deep in each buttock at 0 hours. Nifedipine 10 mg sublingually was administered at the same time or delayed if diastolic blood pressure (DBP) was below 100

mm Hg. These drugs were repeated 6 hourly depending upon the response of BP, respiratory rate, convulsions and urine output. Group B were not given Nifedipine as antihypertensive and only sedatives either pethidine or diazepam with $MgSO_4$ were administered. The cases with IUD on admission and pregnancy with more than 36 weeks were terminated after control of convulsions either by induction or by caesarean section. The cases below 36 weeks, were allowed to continue till maturity.

Result

There were equal number of nullipara and multipara. The mean age of the cases was 28.2 and 25.3 years in Group A and Group B respectively.

Gestational age

The analysis had shown that the gestational age ranged from 20 to 39 weeks (Table I). There was one case of 22 weeks (1.81%) and 25 cases (45%) were of ≥ 35 weeks of gestation.

Table I
Gestational age in Antepartum Eclampsia of Study and Control Group

Weeks of Gestation	Group A N-55	Group B N-42
20-24	1 (1.81)	-
25-29	9 (16.36)	2 (4.75)
30-34	20 (26.36)	10 (23.30)
≥ -35	25 (45.45)	30 (71.43)

Figures in parenthesis shows percentage

Analysis of Blood Pressure

The systolic blood pressure (SBP) and diastolic blood pressure (DBP) showed that SBP was ranging from 110 to 149 mm Hg in maximum of 37 (61.66%) cases in Group A, while SBP of 150 to 189 mm Hg in 40 (66.66%) cases of Group B (Table II).

Range of DBP from 120 to 139 mm Hg was present in 39 (65%) Group A while 90 to 119 mm Hg in 34 (56.66%) of Group B (Table II).

Table III
Pre and Post – Treatment Mean SBP and Mean DBP

Group A	Pre treatment BP	Post treatment BP	Fall in BP
Mean SBP in mm Hg	162	131	31
Mean DBP in mm Hg	111.74	88.2	23.54
Group B			
Mean SBP in mm Hg	158	146	12
Mean DBP in mm Hg	110.48	96.20	15.28

Table IV shows the mean SBP & DBP before and after treatment. In Group A the fall of SBP was 31 mm Hg as compared to 12 mm Hg in Group B. Similarly mean fall of DBP in Group A was 23.54 mm Hg where as in Group B it was 15.28 mm Hg.

Table IV
Distribution of Parity with No. of Convulsions

Convulsions	Group A		Group B	
	Primi	Multi	Primi	Multi
1-3	12 (20)	14 (23.33)	16 (26.66)	08 (13.33)
4-7	14 (23.33)	03 (5)	08 (13.33)	10 (16.66)
8-10	04 (6.66)	04 (6.66)	06 (10)	06 (10)
> 10	03 (5)	01 (1.66)	06 (10)	-

Figures in parenthesis shows percentage

Type of Eclampsia

Of the total 60 cases of Group A the cases of antepartum and postpartum eclampsia were 55 (91.66%) and 5 (8.33%) respectively. Of Group B 60 cases, antepartum were 42 (70%) and postpartum were 18 (30%).

Number of convulsions

The number of convulsions in both Groups in

Table II
Range of SBP and DBP in Study and Control Group

Range of SBP in mm Hg	Group A	Group B	Range of DBP in mm Hg	Group A	Group B
< 110	2		< 90	5	
(3.33)	(8.33)				
110-149	37	12	90-119	15	34
	(61.66)	(20)		(25)	(56.66)
150-189	12	40	120 – 139	39	20
	(20)	(66.66)		(65)	(33.33)
190-220	09	08	≥ 140	01	06
	(15)	(13.33)		(1.66)	(10)
Total	60 (100)	60 (100)		60 (100)	60 (100)

Figures in parenthesis shows percentage

relation to parity is shown in Table IV. Twentyfive cases (41.66%) of Group B had 1-3 convulsions following treatment, while none in Group A had repeat convulsions. There was no relation of parity to number of convulsions.

Maternal and Fetal Outcome

There were 2 maternal deaths (3.33%) in Group A, while there were 4 maternal deaths (6.66%) in Group B. In Group A, the deaths were due to severe anemia and associated heart disease. None of them had PPH. In Group B, deaths were due to pulmonary embolism in 2, severe anemia in 1 and cerebral haemorrhage in 1. In Group A 3 newborn died due to preterm delivery and in 8 cases already there was intrauterine deaths (IUD) before start of treatment. In Group B post treatment fetal loss were 22 and 8 cases were IUD at admission.

Mode of Delivery

Normal vaginal delivery in Group A was 42 (70%) while in Group B was 46 (76.3%). In Group A operative delivery was 18 and in Group B it was 14.

Discussion

All the patients responded to the Magnesium Sulphate and Nifedipine regime and there was not a single case who had convulsions after starting this therapy, till delivery, giving the response to be 100% in Group A where antihypertensive Nifedipine was used.

Following the treatment, all the cases who were received in unconscious state regained consciousness. There were 2 maternal deaths in Group A while 4 in Group B. The contributory factor in the 2 cases in Group A were severe anemia and cardiac disease. In the Group B, the cause of death was pulmonary embolism in 1, severe anemia in 1 and cerebral haemorrhage in other two. Clinical and experimental observations had demonstrated that when the arterial pressure rises above a critical threshold it rapidly causes direct arteriolar injury (Goldby & Beilin 1972, Johansson et al, 1974). This explains why cerebral haemorrhage is a complication of extreme hypertension and accounts for the undisputed benefits of therapeutic control of blood pressure (Pickering 1968). In pregnancy, severe hypertension remains a major cause of maternal mortality and morbidity as well as being associated with significant fetal problems (Page & Christianson 1976, Department of Health and Social Security 1982). The reported maternal mortality rate (MMR) was between 0.3-3.4 by Pritchard and Pritchard (1975). Zuspan (1978), Pal et al, (1966) had reported high MMR of 10.72. The present study believed the fact that the addition of Nifedipine to $MgSO_4$ has definitely reduced the maternal fatalities. There is a lot of controversy about obstetrical management of eclampsia patients. There was a general belief, once the woman regained consciousness, to the extent that she could be oriented as to time and place, the delivery had to be done. Without obstetric contraindication to the vaginal delivery, the labour should be induced or pregnancy terminated by caesarean section (Pritchard & Pritchard 1975). Our management with $MgSO_4$ Nifedipine had allowed pregnancy to be continued till maturity in 94.25% in Group A and 50% in Group B till maturity. Often the case regained consciousness with reduction of blood pressure and increase in urine output.

The present mechanism of management with Nifedipine and $MgSO_4$ has helped us to continue the pregnancy till the acceptable survival time of the baby. The overall perinatal mortality, including IUD was found to be 21.87% (Group A) as compared to 50% (Group B). But when only antepartum eclampsia cases, after starting treatment were analysed, the incidence of perinatal loss was only 5.86% and with a full term live delivery of 76.47% and preterm live birth of 17.55%. The perinatal mortality rate was reported to be 15.4% by Pritchard & Pritchard (1975) where they used $MgSO_4$ with hydrallazine.

The caesarean section rate was reported to be around 62% (Lopez – Llera et al 1976, Al Mulhim A et al 1994). The place of routine caesarean section in the treatment of eclampsia is debatable. Though others believe in the fact that patient should be delivered by caesarean section as soon as possible if fetus is alive unless vaginal delivery is eminent. In the present study we believe that the pregnancy should be continued till maturity if the convulsions are controlled and blood pressure maintained by drugs.

Our study of $MgSO_4$ and Nifedipine regime could safely, allow eclampsia patients to continue pregnancy till term and have safe and healthy maternal and fetal outcome.

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