ORIGINAL ARTICLE

Maternal Outcome in Eclampsia with Low Dose Magnesium Sulphate Therapy

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Abstract

The cross- sectional study was undertaken to evaluate maternal outcomes with low dose magnesium sulphate therapy in patients admitted with and those who developed eclampsia after admission. The study included 123 eclampsia patients. The patients were subjected to low dose magnesium sulphate therapy as first loading dose of 4 gm intravenous diluted in 20 cc of 5% dextrose, slower over 15-20 minutes, followed by maintenance dose of 2 gm intravenously similarly diluted 3 hourly till 24 hours after delivery or after last convulsion, whichever was later.Toxicity of magnesium sulphate was assessed before each dose in the form of deep tendon reflexes, urine output (30 ml/hour) and respiratory rate (16/minute). Termination of pregnancy was undertaken in all cases of eclampsia. Delivery was expedited in the form of induction/ augmentation of labor or LSCS depending upon assessment of each case. Over a period of one year of study, there were 16213 deliveries and 123 cases of eclampsia making an incidence of 0.76%. Among 81 patients who had antepartum/intrapartum eclampsia, 59 (72.83%) delivered vaginally spontaneously, 3 (3.70%) had assisted vaginal deliveries and 19 (23.45%) patients underwent LSCS. There was only one maternal death with maternal mortality rate of 0.81%. Only 8 (6.50%) patients developed respiratory tract infection, 6 (4.87%) patients developed PPH, 2 (1.62%) patients developed cerebrovascular accident, 7 (5.69%) patients developed abruption placenta. No treatment failure was seen and only 1 (0.81%) patient had fit recurrence. Majority of the patients (60.16%) had hospital stay of less than 6 days. No case of magnesium sulphate toxicity was reported. Thus, low dose magnesium sulphate therapy is as effective as high dose standard regimen with favourable maternal outcome.

Key Words

Eclampsia, Magnesium Sulphate, Pre-eclampsia, Pregnancy, Labour

Introduction

Eclampsia is defined as the development of seizures that cannot be attributed to other causes and/or unexplained coma associated with signs of pre-eclampsia during pregnancy, labor or within 7 days of delivery(1). There has been some debate regarding the choice of anti-convulsant agents but this controversy has been resolved once for all by The Eclampsia Trial Collaborative Group Study and Cochrane review which concluded that magnesium sulphate was safer and better than phenytoin, diazepam and lytic cocktail. It has advantage of being having lower cost, ease of administration, rapid onset of action, less sedation and has easily available antidote (calcium gluconate) (2,3). The World Health Organisation has also recommended magnesium sulphate as the most effective, safe and low cost drug for the treatment of eclampsia (4). Pritchard Regimen has been the gold standard since the original article describing it was published (5). However, high toxicity has been a major concern particularly when recipient are of small built. Many authors have suggested that the dose of magnesium sulphate should be limited in women who are known to be or appear to be small. Women in India,

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especially from rural areas or from low socio-economic strata, tend to have smaller weights. Administering Pritchard Regime might prove to be hazardous in these low weight women and there is possibility of most dreadful respiratory failure (6). With this in mind, the dose of MgSO4 was modified and a standardized protocol has been formulated to suit our Indian woman who on an average weigh much less than their counterparts in the western world. Various Indian authors have conducted studies on low dose magnesium sulphate in eclampsia and found that various parameters of maternal outcome were comparable with standard regimes. It was also found that failure rate of magnesium sulphate and fit recurrence rates were also almost similar (6,7,8). Our present cross-sectional study, using low dose magnesium sulphate therapy, was planned to evaluate the maternal outcome in all patients of eclampsia admitted in our institution.

Material and Methods

This cross-sectional study was conducted on 123 patients who were admitted in Obstetrics Emergency Ward of SMGS Hospital, Government Medical College, Jammu as cases of eclampsia or who developed eclampsia during intranatal and postnatal period. The particulars of the patients were noted according to the prescribed proforma. All the patients presenting with eclampsia were subjected to detailed history and clinical examination including general physical, obstetrical and systemic examination. Particular enquiry was made regarding history of increased blood pressure, pedal edema and blurring of vision. All the investigations including Hb, BT, CT, routine urine examination, PT, PTI, platelet count, renal function test, liver function test and urine for albumin were done.

Protocol for Eclampsia:

Loading dose: 4 gram magnesium sulphate was given intravenously, diluted in 20cc of 5% dextrose, slower over 15-20 minutes.

Maintenance dose: 2 gram magnesium sulphate intravenously, similarly diluted was given 3 hourly till 24 hours after delivery or after last convulsion, whichever was later.

For recurrence of convulsion: If convulsion occurred half-an-hour after the loading dose, then only it was taken as recurrence of convulsion and in that case an additional dose of 2 gram intravenously was given and previous dose schedule of three hourly injection to be continued.

Failure of treatment would mean uncontrolled convulsions even after 2 additional doses.

All the patients were monitored on clinical criteria. Before each dose of magnesium sulphate, toxicity in the form of deep tendon reflexes, urine output (30 ml/hour) and respiratory rate (16/minute) was assessed. Since the margin of safety with low dose MgSO4 therapy is very high, so low serum MgSO4 levels were not done.

Intravenous labetalol was used as first line antihypertensive therapy, unless contraindicated, in patients who had systolic blood pressure

> 160 mmHg or diastolic blood pressure > 110 mmHg to prevent cerebrovascular accidents.

Hydration was maintained by ringer lactate solution 1000cc over 24 hours and intravenous fluids were restricted to prevent circulatory overload. Patients were encouraged to take fluids orally as soon as they recovered consciousness.

Termination of pregnancy was undertaken in all cases of eclampsia. Delivery was expedited in the form of induction/augmentation of labor or LSCS depending upon assessment of each case.

Results

Over a period of one year of study, there were 16213 deliveries and 123 cases of eclampsia making an incidence of 0.76%. The mean age of 123 patients was 25.07 (range 19-40) years, mostly in the age group of 21-25 years (63; 51.21%), followed by the age groups of 26-30 years (44; 35.78%), <20 years (11; 8.94%) and >31 years (5; 4.07%). There were 11 Eighty seven patients (70.73%) had the rural background and 36 (29.27%) were from urban areas. Eighty nine (72.36%) were primigravidae while 34 (27.64%) were multigravidae.

Majority (43.09%) of the cases had gestational age more than 36 weeks. Twenty-five (20.33%) were between 32-36 weeks. Only 3 (2.44%) had gestational age less than 32 weeks and 42 (34.14%) patients had postpartum eclampsia. Maximum (52.85%) patients were unbooked and had no antenatal records at the time of

Table 1. Maternal Morbidity and Mortality (n=123)

Complications	Patients	
	No.	Percentage (%)
RTI	8	6.50
Abruptio placenta	7	5.69
Temperature >39^{0}C	6	4.87
PPH	6	4.87
Tongue bite	6	4.87
CVA	2	1.62
Death	1	0.81
Coma	1	0.81
Cerebral edema	1	0.81

Table 2. Duration of Stay in Hospital

Duration of stay in hospital (in days)	Patients	
	No.	Percentage (%)
<4	7	5.69
4 – 6	67	54.47
7 – 9	26	21.14
10 – 12	23	18.70
Total	**123**	**100.00**

admission to our hospital, while 58 (47.15%) were having antenatal records.

Eighty-one patients (65.86%) had antepartum/ intrapartum eclampsia, while 42 (34.14%) had postpartum eclampsia. Sixty-nine patients (56.10%) had first fit at home while 39 (31.71%) had first fit at hospitals other than SMGS hospital. Only 15 patients (12.19%) had first fit at SMGS hospital.

Out of 123 patients, systolic blood pressure was more than or equal to 200 mmHg in 11 (8.95%). Sixty-two (50.40%) had systolic blood pressure >160 mmHg and in rest of the patients systolic blood pressure was <160 mmHg. Seventy-five (60.97%) patients had diastolic blood pressure more than or equal to 110 mmHg and 48 (39.02%) had diastolic blood pressure less than 110 mmHg. Majority of the patients (89.43%) had history of five or less convulsions. Only one patient experienced more than 10 fits. Out of 81 patients admitted as antepartum/intrapartum eclampsia, 68 were in labour at the time of admission while 13 were not in labour. Fifty-nine (72.84%) patients had spontaneous vaginal deliveries, 3 (3.70%) had assisted vaginal deliveries; while 19 (23.45%) underwent LSCS.

There was one (0.81%) patient who experienced coma and later died. Febrile morbidity was observed in 6 (4.87%) cases. Respiratory tract infections were there in 8 (6.50%) patients. Six (4.87%) patients had PPH while another 6 (4.87%) had tongue bite. One (0.81%) patient developed cerebral edema and 2 (1.62%) had cerebrovascular accident. Out of 7 (5.69%) cases of abruptions, 6 were IUDs (*Table 1*). In majority (60.16%) of the patients, duration of stay in hospital was less than or equal to 6 days, while 49 (39.84%) had a stay longer than six days (*Table 2*).

Discussion

The patients in our study were given low dose magnesium sulphate regimen and were evaluated for maternal outcome. In the present study, only one eclamptic patient on low dose magnesium sulphate regimen had fit recurrence. So, the fits were controlled with loading dose in 122 (99.19%) patients. No treatment failure was seen in 123 cases of eclampsia. Our results are comparable with Nagar *et al.* (9), who showed a fit recurrence rate of 1.98%. There was no case of treatment failure in our study, while Pritchard *et al.* (10) and Sibai (11) have reported failure rate of 1-2%.

In the present study, one maternal death occurred thus maternal mortality rate was 0.81%. It was a case of

antepartum eclampsia and patient died of stroke. Maternal deaths using magnesium sulphate (standard dose) in eclampsia have ranged from none to as high as 21%. Pritchard *et al*. (10) have reported a mortality of 0.4% while Nagar *et al*. (9) have reported zero mortality. Saha *et al.* (12) reported maternal mortality of 5.5%.

It was 2% in a study by Seth *et al.* (13) while Sibai (11) in a study reported maternal mortality of 0.4%. Eight (6.50%) patients in our study developed respiratory tract infection, 6 (4.87%) patients developed PPH.

In The Eclampsia Trial Collaborative Group (2), 1.8-3.1% patients developed pulmonary edema and pneumonia developed in 2 to 3.9% patients. Seth *et al.* (13) reported that 15.4% patients of eclampsia developed PPH, 3.8% had pulmonary edema and 3.8% developed aspiration pneumonia.

In our study, only 2 (1.63%) patients developed cerebrovascular accident, out of which 1 died, while cerebrovascular accident were observed in 2.9 to 3.8% in The Eclampsia Trial Collaborative Group (2).In our study, majority (60.16%) of the cases had hospital stay of less than 6 days. Our results are comparable to Regmi *et al.* (14), who reported mean hospital stay of 7.19 days. Last of all, there was no case of MgSO4 toxicity in our study; so we did not discontinue treatment in any of the patients.

Our results have validated the works of many Indians authors who have administered low dose magnesium sulphate therapy in their studies viz., Sardesai *et al.* (6) and Seth *et al.* (13). However, more studies particularly multicentric should be carried out to standardize low dose protocol in Indian settings.

Conclusion

It can be safely concluded that low dose magnesium sulphate therapy is as effective as high dose standard regimen. Moreover, it appears to be safer also.

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