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Original research article

BODY FRIENDLY, SAFE AND EFFECTIVE REGIMEN OF $MgSO_4$ FOR ECLAMPSIA

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ABSTRACT

Pre-eclampsia and eclampsia are major health problems in developing countries. $MgSO_4$ is the standard drug in the control of convulsions in eclampsia. Our study carried out at PDVVPF's hospital is based on the low dose regimen than Pritchard, which is suitable for Indian women who are of smaller built than women in western world. This prospective study included 50 eclampsia patients receiving low dose $MgSO_4$ therapy. The loading dose of $MgSO_4$ was 9gm. Following this 2.5 gm was given intramuscularly every 6 hourly for 24 hours after administration of the loading dose. Patients were monitored hourly by observing their respiratory rate, knee jerk and urine output. Out of 50, two patients required Pritchard regimen, rest completely recovered from eclampsia. The maternal and perinatal morbidity and mortality were comparable to those of the standard Pritchard regime. The study did not find a single case of magnesium related toxicity with low dose $MgSO_4$ regime. Low dose magnesium sulphate regime was found to be safe and effective in eclampsia.

Key Words : Eclampsia, Pritchard Regime, Low dose $MgSO_4$.

INTRODUCTION

Eclampsia is a common cause of maternal mortality worldwide particularly in the developing countries. It is estimated that every year eclampsia is associated with about 50,000 maternal deaths worldwide, most of which occur in developing countries.[1] The incidence of eclampsia in our country varies from 0.5%-1.8%. The major breakthrough in the management of eclampsia came when Dr. J. A. Pritchard published his standardized $MgSO_4$ treatment regime in 1984. The collaborative Eclampsia Trial which was a large multicentric trial in 27 centres in 9 developing countries, found magnesium sulphate to be a better anticonvulsant in the management of eclamptic seizures when compared to phenytoin and diazepam.[2] There has been a constant discussion in literature regarding dose of Magnesium sulphate and therapeutic serum Magnesium levels. J A Pritchard commented that if a woman is known to be or appear to be small, the dose should probably be limited.[3] Winit Phauapradit et al commented that is appropriate to take into account body weight when considering the dosage of drug for Asian women with body

weight less than 7okg. The aim of the present study was to evaluate the effectiveness of low dose magnesium sulfate in control of convulsions in eclampsia, to assess the magnesium related toxicity and to analyze the maternal and perinatal outcome.

MATERIALS AND METHODS

During the study period of 2009 to 2011, at Dr. Padmashree Vithalrao Vikhe Patil Hospital, 50 cases of antepartum eclampsia were included in the present study after human ethical committee approval. Patients with a history of generalized tonic-clonic convulsions, elevated blood pressure and proteinuria with no previous history of seizure disorders like epilepsy were included in the present study. Patients were excluded from study if there was doubt about the diagnosis because the accompanying relatives did not witness the seizure, there was no elevated blood pressure on admission or had received diazepam as anticonvulsant prior to admission. After taking written informed consent from each patient that fulfilled the inclusion criteria patients received loading dose of 4 grams of magnesium sulphate (20%) i.v. with 2.5 grams (50%) i.m. in each buttock. Subsequently, maintenance dose of 2.5 grams (50%) was given i.m. in alternate buttock every 6 hours up to 24 hours after delivery or after last convulsion, whichever was later. Serum Mg^{++} level was measured 12 hours after the first dose. If convulsions were not controlled by the low dose regime, then the case was shifted to the standard Pritchard regime. Patients were monitored for respiratory rate, Urine output (30ml/ hour) & deep tendon reflexes same as that of Pritchard regimen. All the principles of management of eclampsia are followed. After stabilization of patients, labour was induced or augmented. Cesarean section was performed for obstetric indications.

RESULTS

During the study period, 57 (2.4%) cases of antepartum eclampsia were noted among the 2375 deliveries. Among these, 50 cases were included in the study. Most of the patients (36 cases; 72%) had not taken antenatal care. The patients were from 17 years to 35 years with a mean age of 21 years. 78% cases were primigravidas.

The total dose of magnesium sulphate, required for control of convulsions was less than 20 grams ie.56.82% less than that is required in standard Pritchard regime. The serum magnesium levels were monitored in all cases for evidence of magnesium toxicity. The mean serum magnesium value ranged between 4.1 to 4.35meq/lit during the low dose regime. There was no maternal mortality due to eclampsia or its complication in the present study. In present study Microsoft excel was used for statistical analysis.

Table: 1. Comparison of our regime with Pritchard's regime

	$MgSO_4$ regime	Pritchard's regime
Control of convulsions	96%	93.33%
Recurrence Rate	4%	6.67%
Cases requiring a shift to the standard Pritchardt regime	4%	-
Perinatal mortality	12%	33.84%
Serum Magnesium level	4.1 to 4.35meq/lit	3.74-6.14mg/dl
Signs of drug toxicity	0	2%

Table:2. Comparison of total dose of $MgSO_4$ in different regimes

Name of regime	Pritchard regime	Low dose Padhar regime	Low dose Dhaka regime	$MgSO_4$ low dose regime
Loading dose MgSO4 (20%) IV	4gm	3gm	4gm	4gm
Loading dose MgSO4 (50%) IM	10gm	5gm	6gm	5gm
Maintenance dose (50%) IM	5gm 4 hrly	2.5gm 4hrly	2.5gm 4 hrly	2.5gm 6 hrly
Total dose (gm) in 24 hrs	30	23	25	19

DISCUSSION

The incidence of eclampsia within the study period was 2.4% which underscores the magnitude of the disease. Other factors found associated with eclampsia in this study were young maternal age; primigravidity and lack of prenatal care which are similar to what have been reported by other workers. [5, 6] Also majority of these patients belongs to the lower socioeconomic group. 84% patients had body weight less than 50kg. Pritchard regime was standardized for western women, having total bodymass index much higher than women from developing countries, including India. In present study convulsions were controlled in 96% of cases with total dose less than 20 gms (43.18% of pritchard regime. In present study intramascular dose was reduced to 2.5gms at 6 hr interval. This did not affect the efficacy of regime as evidenced by serum Mg levels at 12 hrs. However this significantly decreased incidence of pain at injection site, tissue necrosis and abscess formation. Rashida Begum et al[7] in their study, reported that eclamptic convulsions were controlled in 98% cases with modified (Dhaka) regime of magnesium sulphate. Results of the present study were comparable with above mentioned studies. Begum MR et al[8] suggested a small body mass index to be the reason for effectiveness of low dose regimen in women in developing countries. There was no maternal mortality in the present study. Perinatal mortality in the present study was 12%. The majority (66.7%) of deaths were stillbirths and 33.3% were neonatal deaths. Prematurity, placental abruption and growth restriction were common causes of perinatal deaths. Sardesai Suman et al reported 33.90% perinatal mortality.[9] The mean serum magnesium levels remained in the range of 4.1 to 4.35meq/lit during low dose magnesium sulphate regime. Therefore low dose regimens, might significantly improve the safety. Moreover, low dose MgSO4 might be used in cases with mild renal impairment which is usually present in these patients.

CONCLUSION

Associated with similar efficacy in controlling convulsions and potentially more favorable toxicity and complication rates, the use of low dose MgSO4 protocols is a viable alternative to standard dose therapy. The dose required for control of a convulsion with the low dose magnesiumsulphate regime was less than half of the standard Pritchard regime making it a body friendly regime. However multi-center, randomized controlled trials are recommended to test this proposed regimen to support routine clinical use low dose protocols.

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