

A Study on Low Dose Magnesium Sulphate Regime for Eclampsia in a Tertiary Care Teaching Hospital in North India

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ABSTRACT

Eclampsia is a leading cause of maternal and perinatal morbidity and mortality in developing countries. MgSO₄ in the Pritchard regime is associated with more toxicity. This study was conducted in 50 eclamptic patients in Teerthanker Mahaveer Medical College Hospital & Research Centre, Moradabad, U.P. to find out the efficacy of Low Dose Magnesium sulphate regime for the control of convulsions. Low dose MgSO₄ regime was found to be safe and effective in eclampsia along with bringing down the total cost of therapy.

Key words: Eclampsia, Pritchard regime, low dose magnesium sulphate.

INTRODUCTION

Eclampsia is one of the most common cause of maternal and perinatal morbidity & mortality in developing countries. J.A. Pritchard used magnesium sulphate for control of convulsions in eclampsia¹. Since then MgSO₄ has been the mainstay in the management of eclampsia worldwide. Magnesium sulphate acts on the peripheral myoneural junctions and blocks the impulse transmission. Flower *et al.*,² adjusted doses of MgSO₄ according to body weight, plasma level & urinary excretion of magnesium sulphate. Pritchard suggested that the dose of MgSO₄ should be reduced in women who have low body weight. Sardesai Suman *et al.*,⁴ found low dose magnesium sulphate regime in eclamptic patients in India as very effective & safe. This study was undertaken with the aim to evaluate the effectiveness of low dose magnesium sulphate in control of convulsions in eclampsia, to assess the magnesium related toxicity & to analyze the maternal and perinatal outcomes.

MATERIALS AND METHODS

This prospective study was carried out over a period of two years (Jan 2010 – Jan 2013) in

the department of Obstetrics & Gynaecology at Teerthanker Mahaveer Medical College & Research Centre, Moradabad, U.P. (India).

Inclusion Criteria

All patients with eclampsia coming to the labour ward & emergency at our institution were included in this study, after ruling out the exclusion criteria.

Exclusion criteria

- Patients who had received anticonvulsant treatment before admission to the hospital
- Those who presented with complications like cerebro vascular accident, renal failure, aspiration pneumonitis & HELLP Syndrome were excluded from the study.

Standard principles of management of eclampsia were followed

Protocol followed in the Low Dose MgSO₄ regime

Written & informed consent was taken from the attendants of the cases who were included in the study.

Loading dose of 4 gm of 20% MgSO₄ was given intravenously over five to ten minutes time.

Subsequently, maintenance dose of 2 gm of 50% solution of $MgSO_4$ was given deep intramuscularly in alternate buttock every 4 hourly till 24 hours after delivery or after the last convulsion, whichever was later.

If there was recurrence of convulsion after 30 minutes of the initial loading dose, additional 2 gm of 20% magnesium sulphate solution was given intravenously. If convulsions were not controlled after repeating two such additional doses, then the case was shifted to the standard Pritchard regime & was labelled as failure of low dose regime.

Efficacy of the low dose regime was assessed by control of convulsions & by noting the total quantity of magnesium sulphate required for the same.

All cases were monitored for evidence of magnesium toxicity by the absence of deep tendon reflexes, respiratory depression & measurement of urinary output. If any toxicity was noted, next dose of $MgSO_4$ was withheld & the toxicity was managed with calcium gluconate infusion.

Obstetric management was done by induction and augmentation of labour & caesarean section was done for obstetrical indications like antepartum haemorrhage, cephalopelvic disproportion or fetal distress & malpresentations. Relevant information in every case was recorded in the study proforma.

RESULTS

It was observed that 45 (90 %) cases of eclampsia were unbooked, were below 25 years of age, most patients were uneducated, had no antenatal check ups, belonged to the low socio-economic stratum. 38 (75 %) cases were primigravidas. 35 (70 %) cases had body weight between 40 & 50 kg at the time of admission. 23 (46 %) cases were term pregnancies, 15 (30 %) were preterm & 12 (24 %) were postterm. 37 (74%) cases had antepartum, 5 (10 %) had intrapartum & 8 (16 %) cases had postpartum onset of eclampsia (Table 3). 36(72 %) cases had less than 3 convulsions before admission to hospital.

Table 1: Efficacy of Low Dose $MgSO_4$ regime to control convulsions

| Regime | Cases (n=50) | Percentage (%) |
|--|--------------|----------------|
| Control of convulsions with low dose regime | 47 | 94 |
| Cases requiring shift to standard Pritchard regime | 03 | 06 |

Table 2: Number of convulsions after Low Dose $MgSO_4$ administration

| S. No. | No. of convulsions | No. of cases (n=50) | Percentage (%) |
|--------|--------------------|---------------------|----------------|
| 1 | 0 | 43 | 86 |
| 2 | 1 | 2 | 4 |
| 3 | 2 | 2 | 4 |
| 4 | 3 | 3 | 6 |

Table 3: Eclampsia according to onset

| Types of Eclampsia | Number of patients | Percentage (%) |
|-----------------------|--------------------|----------------|
| Antepartum Eclampsia | 37 | 74 % |
| Intrapartum Eclampsia | 5 | 10 |
| Postpartum Eclampsia | 8 | 16 |

In 47 (94%) cases, low dose magnesium sulphate regime controlled the eclamptic convulsions.

In the present study, we observed that the total dose of $MgSO_4$, required for control of convulsions was less than 20 gm ie. 54.5 % less than that required in the standard Pritchard regime. There was no evidence of magnesium toxicity in any case. There was no maternal mortality due to eclampsia or its complications in this present study.

DISCUSSION

In our study we found that 90 % of eclampsia patients were unbooked & had no antenatal check ups. Hemlin⁴ (1952) stated that eclampsia was rare if effective antenatal care was available. Mudaliar & Menon⁵ reported 78 % eclamptic patients were primigravidae, which was 75 % in our study.

In our study, we observed that most of the cases belonged to rural area & from low or lower-middle socio-economic group, with body weight < 50 kg (75 %) at the time of admission, which was much lower than those from higher socio-economic status.

In the present study, we found that the eclamptic convulsions were controlled in 94 % cases (Table – I) with total magnesium sulphate of < 20 gm ie. 54.5 % less than that used in the standard Pritchard regime. Sardesai Suman *et al.*,³ stated control of eclamptic fits in 90 % cases with low dose $MgSO_4$. Rashida Begum *et al.*,⁶ in their study reported 98 % control of eclamptic fits with the modified (Dhaka regime) of magnesium sulphate. Bangal V *et al.*,⁷ reported the mean serum magnesium value in low dose $MgSO_4$ regime as ranging between 4.38 and 4.16 meq/L with almost no magnesium toxicity & no maternal mortality.

Results of the present study were comparable with above mentioned studies regarding efficacy of low dose / modified dose regime for control of eclamptic convulsions.

Sardesai *et al.*,³ stated maternal mortality as 2.63 %, that in the collaborative eclampsia trial with Pritchard regime^{1,8} was 3.8 % & 5.2 %. In our study there was no maternal mortality. Overall perinatal mortality in our study was 33 %. Majority (80 %) were stillbirths & 20 % were neonatal deaths. Prematurity, birth asphyxia, placental abruption & growth restriction were common causes for the perinatal deaths. Sardesai *et al* reported 33.90 % perinatal mortality³.

In our study there was no case of serious magnesium toxicity & the cost of therapy was far lower than the standard Pritchard regime as less than half amount of magnesium sulphate was required for the control of fits. Thus, low dose regime was found to be safe regarding the risk of hypermagnesemia in the control of eclamptic convulsions.

CONCLUSION

The present study confirmed that the low dose magnesium sulphate regime was effective for the control of eclamptic convulsions. The dose required for control of fits with the low dose magnesium sulphate regime was less than half of the standard Pritchard regime & the cost of therapy was also less than half as before. There was no serious magnesium related toxicity with the low dose $MgSO_4$ regime. Thus this low dose magnesium sulphate can be used as a change from the standard Pritchard regime, tailored for the Indian women which suits the relatively low body mass index as compared to their western counterparts and can also reduce the total cost of therapy along with the risk of magnesium toxicity.

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