

## LOW DOSE MAGNESIUM SULPHATE REGIME FOR ECLAMPSIA

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### Abstract

Pre-eclampsia is one of the commonest medical complications seen during pregnancy. It contributes significantly to maternal and perinatal morbidity and mortality. Dr.J.A.Pritchard in 1955, introduced magnesium sulphate for control of convulsions in eclampsia and is used worldwide. Considering the low body mass index of Indian women, a low dose magnesium sulphate regime has been introduced by some authors. Present study was carried out at tertiary care centre in rural area. Fifty cases of eclampsia were randomly selected to find out the efficacy of low dose magnesium sulphate regime to control eclamptic convulsions. Maternal and perinatal outcome and magnesium toxicity were analyzed. It was observed that 86% cases responded to initial intravenous dose of 4 grams of 20% magnesium sulphate. Eight percent cases, who got recurrence of convulsion, were controlled by additional 2 grams of 20% magnesium sulphate. Six percent cases required shifting to standard Pritchard regime, as they did not respond to low dose magnesium sulphate regime. The average total dose of magnesium sulphate required for control of convulsions was 20 grams i.e. 54.4% less than that of standard Pritchard regime. The maternal and perinatal morbidity and mortality in the present study were comparable to those of standard Pritchard regime. The study did not find a single case of magnesium related toxicity with low dose magnesium sulphate regime. Low dose magnesium sulphate regime was found to be safe and effective in eclampsia.

**Key Words :** Eclampsia, Pritchard Regime, Low dose magnesium sulphate.

### Introduction

Eclampsia still continues to remain the common cause of maternal mortality in developing world. The first principle in the management of eclampsia is the control of convulsions. Various drugs have been tried in the last century for this purpose<sup>[1]</sup>. Dr.J.A.Pritchard used magnesium sulphate for control of convulsions in eclampsia cases at Parkland Hospital, USA. Magnesium sulphate acts on peripheral myoneural junction and blocks the impulse transmission. Different magnesium sulphate dose protocols have been used in treating eclampsia, amongst which, Pritchard regime is widely used<sup>[2]</sup>. Flower et al<sup>[3]</sup> adjusted doses of magnesium sulphate according to body weight, plasma level and urinary excretion of magnesium sulphate. Dr.J.A.Pritchard suggested that, the dose of magnesium sulphate should be reduced in women who

are small. Sardesai Suman et al<sup>[4]</sup> used low dose magnesium sulphate regime in eclampsia in Indian women and found to be very effective and safe. The aim of the present study was to evaluate the effectiveness of low dose magnesium sulphate in control of convulsions in eclampsia, to assess the magnesium related toxicity and to analyze the maternal and perinatal outcome.

### Material and Methods

This prospective study was carried out over a period of two years in the department of Obstetrics and Gynecology at Rural Medical College, Loni. Fifty cases of eclampsia were randomly selected for inclusion in the study. Cases who had received anticonvulsant treatment before admission to the hospital and those who presented with complications like cerebrovascular accident, renal failure, aspiration pneumonitis and HELLP syndrome were excluded from the study. Standard principles of management of eclampsia were followed.

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Following protocol was used in low dose magnesium sulphate regime in eclampsia: Written informed consent was obtained from the cases, who were included in the study. Loading dose of four grams of magnesium sulphate (20% solution) was given intravenously over five minutes time. Subsequently, magnesium sulphate maintenance dose of two grams (50% solution) was given deep intramuscularly in alternate buttock every four hour till 24 hours after delivery or after last convulsion, whichever was later. If there was recurrence of convulsion after 30 minutes of initial intravenous loading dose, additional 2 grams of 20% magnesium sulphate solution was given intravenously. If convulsions were not controlled after repeating such two additional doses, then the case was shifted to standard Pritchard regime and was labelled as failure of low dose regime. Efficacy of low dose magnesium sulphate regime was assessed by control of convulsions with low dose protocol and by noting the total quantity of magnesium sulphate required for control of convulsions.

All cases were monitored for evidence of magnesium toxicity in the form of evidence of deep tendon reflexes, depression of respiration and measurement of serum magnesium levels. If any toxic effects were observed, next dose of magnesium sulphate was withheld and the toxicity was managed.

Time and mode of termination of pregnancy was decided by the senior obstetrician. Baby was managed by pediatrician following vaginal delivery or cesarean section till discharge. Relevant information in every case was recorded in study proforma.

## Results

It was observed that 90% of cases of eclampsia were unbooked and were below 25 years of age. Seventy five percent cases were primigravidas. Seventy percent cases had body weight between 40 and 50 kilograms at the time of admission. Forty six percent cases were full term and thirty percent cases were preterm. Seventy four percent cases had antepartum onset of eclampsia, where as remaining had either intrapartum or postpartum onset. Seventy two percent of cases had less than 3 convulsions before admission to hospital.

Regime	Cases (n-50)	Percent age (%)
Control of convulsions with Low Dose regime	47	94
Cases requiring shift to standard Pritchard regime	03	06

**Table1: Efficacy of low dose MgSo4 regime to control convulsions**

Sr. no.	No. of convulsions	Number of cases(n=50)	Percent age
1	Nil	43	86
2	1	02	4.
3	2	02	4
4	3	03	6

P value > 0.05 - statistically significant.

Z=0.30, P>0.05.

**TableII: Number of convulsions after administration of low dose regime**

In 94% cases, low dose magnesium sulphate regime was enough to control eclamptic convulsions.(Table-I and II ). In the present study, we also observed that the total dose of magnesium sulphate, required for control of convulsions was less than 20 grams ie. 54.5% 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 4.38 and 4.16 meq/lit during low dose regime. Mean baseline s.magnesium value was 1.55 meq/lit. There was no evidence of toxicity in any case. There was no maternal mortality due to eclampsia or its complication in the present study.

## Discussion

Early antenatal registration play an important role in good pregnancy outcome. In the present study, it was observed that ninety percent of the eclampsia cases were unbooked or unregistered. Helmin<sup>[5]</sup> in 1952 stated that eclampsia will be a clinical rarity, if effective antenatal care is made available. Mudliar and Menon<sup>[6]</sup>,

and Dawn<sup>[7]</sup> reported that 75% of eclampsia cases were primigravidas. Similar observations were made in the present study.

In the present study, we observed that the majority of cases belonged to rural area and were from middle or lower socio-economic group, with body weight, much lower than women from higher socio-economic group. Seventy percent of women had body weight less than 50 kilograms at the time of admission. Time tested Pritchard regime with its dose schedule was standardized for western women, having total body mass index much higher than women from developing countries, including India. In the present study, we observed that the eclamptic convulsions were controlled in 94% cases (Table-1) with total magnesium sulphate of less than 20 grams ie. 54.5% less than used in standard Pritchard regime. Sardesai Suman et. al<sup>[4]</sup> in her large study on use of low dose Magnesium Sulphate reported that, eclamptic convulsions were controlled in 90% cases<sup>[4]</sup>. Rashida Begum et al<sup>[8]</sup> in their study, reported that eclamptic convulsions were controlled in 98% cases with modified (Dhaka) regime of magnesium sulphate. Results of present study were comparable with above mentioned studies regarding efficacy of low dose / modified dose regime for control of eclamptic convulsions.

There was no maternal mortality in the present study. Maternal mortality reported by Sardesai Suman in her low dose regime was 2.63%, where as the maternal mortality reported by collaborative eclampsia trial with Pritchard regime was 3.8% and 5.2%. Overall perinatal mortality in the present study was 33%. Majority (80%) of deaths were stillbirths and 20% were neonatal deaths. Prematurity, placental abruption and growth restriction were common causes for perinatal deaths. Sardesai Suman et al<sup>[4]</sup> reported 33.90% perinatal mortality<sup>[4]</sup>.

Mean serum magnesium levels were studied. It was observed that serum magnesium levels before giving magnesium sulphate (mean 1.55 meq/lit) were well below the therapeutic levels of magnesium required for control of convulsions. The mean serum magnesium levels remained in the range of 4.16-4.38 meq/lit during low dose magnesium sulphate regime. These levels

were well below the levels required to produce magnesium toxicity. Thus, low dose regime was found to be safe regarding the risk of hypermagnesemia.

## Conclusion

Low dose magnesium sulphate regime was effective for the control of eclamptic convulsions. Dose required for control of convulsion with low dose magnesium sulphate regime was less than half of standard Pritchard regime. There was no magnesium related toxicity with low dose magnesium sulphate regime. There is need for additional multicentric case control trials to support the observations of the present study, before we recommend a change from standard Pritchard regime to low dose magnesium sulphate regime, which suits the Indian women, having relatively low body mass index as compared to their western counterparts.

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