

Research Article

Comparison of Short-Course Magnesium Sulfate and Standard Pritchard Regimen for Prevention of Recurrent Seizures in Eclampsia: A Prospective Comparative Study

Dr. Smrity Naik¹, Dr. Kunti Choudhary^{2*}, Dr. Minu Keshkar³

¹Professor & Head Department of obs & gyne, Govt Medical College Manendragarh, CG, India.

^{2*}Assistant Professor Department of obs & gyne, Late Shri Lakhiram Agrawal Memorial Medical College & SBGGM GOVT. Hospital Raigarh CG, India.

³Assistant Professor Department of obs & gyne, Pt J.N.M. Medical College & BRAM Hospital Raipur Chhattisgarh India.

Corresponding Author: Dr. Kunti Choudhary

Assistant Professor Department of obs & gyne, Late Shri Lakhiram Agrawal Memorial Medical College & SBGGM GOVT. Hospital Raigarh CG, India.

Email: kuntichoudhary07@gmail.com

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ABSTRACT

Background & Objectives: Eclampsia is a life-threatening obstetric emergency characterized by generalized tonic-clonic seizures in women with pre-eclampsia and remains a major cause of maternal morbidity and mortality. Magnesium sulfate is the standard anticonvulsant for preventing recurrent seizures; however, the conventional Pritchard regimen requires prolonged administration and close monitoring. This study compared the effectiveness and safety of a short-course magnesium sulfate regimen with the standard Pritchard regimen in women with eclampsia.

Methods: This prospective randomized interventional study was conducted in the Department of Obstetrics & Gynaecology, Pt. JNM Medical College and Dr. BRAM Hospital, Raipur, India, from August 2021 to December 2022. One hundred women with eclampsia were randomly allocated to receive either short-course magnesium sulfate (n=50) or the standard Pritchard regimen (n=50). The primary outcome was recurrent seizures, while secondary outcomes included magnesium toxicity, maternal complications, duration of ICU and hospital stay, and recovery parameters.

Results: No recurrent seizures occurred in either group (0% vs. 0%; p=0.943). Magnesium toxicity (0% vs. 12%; p=0.0352) and injection-site pain (10% vs. 92%; p<0.0001) were significantly lower with the short-course regimen. Maternal complications were comparable between groups (p>0.05). Women receiving the short-course regimen had shorter ICU and hospital stay, earlier breastfeeding and oral feeding, and lower healthcare resource utilization (all p<0.05).

Interpretation & Conclusions: Short-course magnesium sulfate is as effective as the standard Pritchard regimen in preventing recurrent seizures while reducing treatment-related toxicity, improving recovery, and decreasing healthcare resource utilization, making it a practical alternative for managing eclampsia, particularly in resource-limited settings.

Keywords: Eclampsia, Magnesium sulfate, Short-course regimen, Pritchard regimen, Recurrent seizures, Maternal outcomes, Magnesium toxicity, ICU stay.

INTRODUCTION

Eclampsia is one of the most serious obstetric emergencies and remains a major cause of maternal and perinatal morbidity and mortality, particularly in low- and middle-income countries. It is characterized by generalized tonic-clonic seizures occurring in women with pre-eclampsia in the absence of other neurological disorders. Despite improvements in antenatal care, hypertensive disorders of pregnancy continue to contribute substantially to maternal deaths worldwide, with eclampsia

representing the most severe clinical manifestation [1,2].

Magnesium sulfate (MgSO₄) is the recommended anticonvulsant for the prevention and treatment of eclamptic seizures because of its superior efficacy over other agents such as diazepam and phenytoin. The World Health Organization recommends magnesium sulfate as the first-line therapy, and the standard Pritchard regimen remains the most widely used protocol, particularly in resource-limited settings [3,4].

However, the standard Pritchard regimen requires repeated intramuscular injections and prolonged monitoring for signs of magnesium toxicity, including respiratory depression, reduced urine output, and loss of deep tendon reflexes. These requirements increase patient discomfort, healthcare workload, treatment costs, and hospital stay, posing challenges in busy tertiary care centers [5,6].

To overcome these limitations, recent studies have evaluated short-course magnesium sulfate regimens aimed at reducing drug exposure while maintaining effective seizure prophylaxis. Evidence published over the past five years suggests that, in carefully selected women, abbreviated regimens may provide comparable protection against recurrent seizures with fewer adverse effects, improved patient comfort, and reduced healthcare costs [7–9]. Nevertheless, concerns remain regarding the risk of recurrent seizures following early discontinuation of therapy, and available studies have reported inconsistent findings across different populations [10]. Given the continued burden of eclampsia in India and the need for effective, resource-efficient treatment strategies, the present study was undertaken to compare the effectiveness of a short-course magnesium sulfate regimen with the standard Pritchard regimen in preventing recurrent seizures among women with eclampsia.

MATERIALS AND METHODS

Study Design: Prospective randomized interventional comparative study.

Study Setting: Department of Obstetrics & Gynaecology, Pt. JNM Medical College and Dr. BRAM Hospital, Raipur, Chhattisgarh, India, after Institutional Ethics Committee approval.

Study Duration: August 2021 to December 2022.

Study Population: Women diagnosed with antepartum, intrapartum, or postpartum eclampsia.

Sample Size: A total of 100 patients were randomly allocated into two equal groups:

Group A (short-course magnesium sulfate, n=50) and **Group B** (standard Pritchard regimen, n=50).

Inclusion Criteria: Women aged ≥ 18 years with eclampsia presenting with generalized tonic-clonic seizures associated with pre-eclampsia and providing informed consent.

Exclusion Criteria: Non-eclamptic seizures, prior complete magnesium sulfate therapy, contraindication to magnesium sulfate, severe renal failure, or incomplete follow-up.

Statistical Analysis: Data were analyzed using SPSS version 27.0. Continuous variables were expressed as mean $\pm$ SD and categorical variables as frequency (%). Group comparisons were performed using the independent Student's *t*-test, Chi-square test, or Fisher's exact test, as appropriate. A two-tailed *p*-value < 0.05 was considered statistically significant.

RESULT

A total of 100 women with eclampsia were randomized equally into the short-course magnesium sulfate group (n=50) and the standard Pritchard regimen group (n=50). Baseline demographic and clinical characteristics, including age, parity, gestational age, BMI, type of eclampsia, proteinuria, and associated complications, were comparable between the two groups (all $p > 0.05$).

Both regimens were equally effective in preventing recurrent seizures, with no recurrence observed in either group (0% vs 0%; $p = 0.943$). However, the short-course regimen demonstrated a significantly better safety profile, with no cases of magnesium toxicity compared to 12% in the Pritchard group ($p = 0.0352$) and markedly less injection-site pain (10% vs 92%; $p < 0.0001$). Maternal complications, including postpartum haemorrhage, pulmonary oedema, deep vein thrombosis, cerebrovascular accident, and PRES, were infrequent and did not differ significantly between groups (all $p > 0.05$).

The short-course regimen was associated with significantly improved recovery outcomes, including shorter ICU and hospital stay, earlier initiation of breastfeeding and oral feeding, and substantially fewer healthcare staff interactions (all $p < 0.05$). Overall, short-course magnesium sulfate provided comparable seizure prevention with reduced toxicity, improved patient comfort, and more efficient healthcare resource utilization compared with the standard Pritchard regimen.

DISCUSSION

The present study demonstrated that both the short-course magnesium sulfate regimen and the standard Pritchard regimen were equally effective in preventing recurrent seizures among women with eclampsia. Baseline demographic and obstetric characteristics were comparable between the two groups, indicating that the observed differences in outcomes were attributable to the treatment regimens rather than differences in patient characteristics.

Similar baseline comparability has been reported in previous randomized and comparative studies evaluating modified magnesium sulfate protocols, thereby supporting the internal validity of our findings [11,12].

Most women in our study were young (21–30 years), primigravidae, and presented at ≥ 34 weeks of gestation. These observations are consistent with previous reports showing that eclampsia occurs predominantly among young, first-time mothers during late pregnancy because of their increased susceptibility to hypertensive disorders of pregnancy [13,14].

Antepartum eclampsia was the commonest clinical presentation in both groups, followed by intrapartum and postpartum eclampsia. Comparable distributions have been described in recent Indian and international studies, where antepartum seizures represented the majority of eclamptic cases presenting to tertiary care centres [15,16].

The most important finding of the present study was the absence of recurrent seizures in either treatment group. This indicates that the short-course magnesium sulfate regimen provides seizure prophylaxis comparable to the conventional Pritchard regimen. Similar conclusions have been reported in studies evaluating abbreviated or low-dose magnesium sulfate protocols, which demonstrated no significant increase in recurrent convulsions despite reduced cumulative magnesium exposure [17–19]. These findings further support current efforts to identify the minimum effective magnesium sulfate regimen without compromising maternal safety.

A major advantage of the short-course regimen was its superior safety profile. No patient in the short-course group developed magnesium toxicity, whereas toxicity occurred in the standard regimen group. Likewise, injection-site pain was dramatically lower with the abbreviated protocol. Comparable reductions in adverse effects have been reported by other investigators, who attributed these benefits to fewer intramuscular injections and lower total magnesium sulfate dosage [18,20]. Reduced toxicity is particularly important in low-resource settings where intensive monitoring may not always be feasible.

Maternal complications such as postpartum haemorrhage, pulmonary oedema, deep vein thrombosis, cerebrovascular accident, and posterior reversible encephalopathy syndrome were infrequent and comparable between the two treatment groups. These findings agree

with previous comparative studies demonstrating that shortening magnesium sulfate therapy does not increase major maternal morbidity when appropriate patient monitoring is maintained [21,22].

An additional strength of the short-course regimen was the significantly shorter ICU stay, earlier hospital discharge, faster initiation of breastfeeding and oral feeding, and markedly fewer healthcare staff interactions. Similar improvements in maternal recovery and healthcare resource utilization have been reported in recent studies evaluating abbreviated magnesium sulfate therapy, highlighting its potential to reduce hospital workload, improve patient comfort, and lower treatment costs without compromising efficacy [23,24].

Overall, the findings of the present study support growing evidence that carefully selected women with eclampsia can be managed safely with a short-course magnesium sulfate regimen. Recent international recommendations continue to endorse magnesium sulfate as the first-line anticonvulsant while emphasizing the need for evidence-based strategies that optimize efficacy, safety, and resource utilization. Our findings add further support to the consideration of abbreviated magnesium sulfate protocols, particularly in resource-constrained settings, although larger multicentre trials are warranted before universal adoption [25].

CONCLUSION

The present study demonstrated that the short-course magnesium sulfate regimen is as effective as the standard Pritchard regimen in preventing recurrent seizures in women with eclampsia. Compared with the standard regimen, it was associated with significantly lower magnesium toxicity and injection-site pain, while maternal complications remained comparable. Women receiving the short-course regimen also had shorter ICU and hospital stays, earlier oral feeding and breastfeeding, and reduced healthcare resource utilization. These findings indicate that short-course magnesium sulfate is a safe, effective, and cost-efficient alternative to the standard Pritchard regimen, particularly in resource-limited settings. Larger multicentric randomized studies are needed to confirm these results.

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TABLES

Table 1. Baseline Demographic and Clinical Characteristics of Study Participants

Variable	Category	Short-course MgSO ₄ (n=50)	Pritchard Regimen (n=50)	p-value
Age (years)	<20	3 (6%)	6 (12%)	0.6586
	21–25	28 (56%)	19 (38%)	
	26–30	13 (26%)	18 (36%)	
	31–35	5 (10%)	5 (10%)	
	>35	1 (2%)	2 (4%)	
Primigravida	Yes	39 (78%)	32 (64%)	0.424
Gestational age	≥34 weeks	34 (68%)	41 (82%)	0.8083
BMI	≥25 kg/m ²	26 (52%)	28 (56%)	0.5659
Type of eclampsia	Antepartum	32 (64%)	38 (76%)	0.2177
	Intrapartum	13 (26%)	5 (10%)	
	Postpartum	5 (10%)	7 (14%)	
Significant proteinuria	≥3+	16 (32%)	17 (34%)	0.936
HELLP syndrome	Present	1 (2%)	1 (2%)	0.4751
Abruptio placentae	Present	1 (2%)	3 (6%)	0.6101

Table 2. Treatment Outcomes, Maternal Morbidity, and Recovery Following Short-course Magnesium Sulfate and Standard Pritchard Regimen

Variable		Short-course MgSO ₄ (n=50)	Pritchard Regimen (n=50)	p-value
Primary efficacy and safety	Recurrent seizure	0 (0%)	0 (0%)	0.943
	Magnesium toxicity	0 (0%)	6 (12%)	0.0352
	Pain at injection site	5 (10%)	46 (92%)	<0.0001
	Ventilator support	5 (10%)	9 (18%)	0.2489
Maternal morbidity	Postpartum haemorrhage	2 (4%)	5 (10%)	0.433
	Pulmonary oedema	3 (6%)	5 (10%)	0.7122
	Deep vein thrombosis	0 (0%)	2 (4%)	0.4751
	Cerebrovascular accident	0 (0%)	1 (2%)	1
	PRES syndrome	1 (2%)	2 (4%)	1

Recovery and resource utilization	ICU stay ≤ 3 days	48 (96%)	17 (34%)	0.001
	Hospital stay ≤ 7 days	50 (100%)	1 (2%)	0.0423
	Breastfeeding within 10 hours	45 (90%)	21 (42%)	<0.001
	Oral feeding within 10 hours	45 (90%)	26 (52%)	0.0461
	Healthcare staff required ≤ 20	50 (100%)	0 (0%)	0.0001

Figure: 1. Treatment Outcomes, Maternal Morbidity, and Recovery Following Short-Course Magnesium Sulfate and Standard Pritchard Regimen

