Original Article

To Determine The Maternal Outcomes In Women Given A Modest Dosage Of Magnesium Sulphate

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Abstract

Aim: The aim of this study to determine the maternal outcomes in women given a modest dosage of magnesium sulphate.

Materials and Methods: This research was conducted at the Department of Obstetrics and Gynecology, with clearance from the institute's ethical committee. Eclampsia patients were placed into two equal groups of 200. Groups 1 (Dhaka regime) and 2 (Pritchard regime). The trial excluded patients with myasthenia gravis, hepatic coma with danger of renal failure, and magnesium hypersensitivity.

Results: There was no recurrence in 92% of the cases, 3 recurrences in 3% of the cases, and more than 2 recurrences in 3% of the cases. In group 1, there were only two recurrences in 2% of the cases, and there were none in 98% of the instances. In group 2, there were one and one recurrence in 1% of the cases, respectively. Maternal problems were noted in 25% of the patients overall. HELLP syndrome and abruption were recorded in 9% of the cases each, DIC in 5% of the cases, PPH and CVA in 1% of the cases each in group 1, and total maternal problems in 33% of the cases. Abruption was recorded in 11% of the patients, HELLP syndrome in 8%, and DIC in 6%. Renal failure and PPH were observed in 3% of the patients, respectively, and CVA in 1% of the cases in Group 2. Maternal mortality was 3% overall. In 1% of the cases, CVA, DIC, and pulmonary oedema were the causes of death. Overall maternal mortality was 8% in groups 1 and 2. In 3% of instances, DIC and acute renal failure were the causes of maternal death, whereas pulmonary oedema and CVA were the causes of mortality in 1% of cases.

Conclusion: There was no statistically significant difference between the groups in the rates of maternal complications or maternal death. Women in India tend to have a lower body mass index than their Western counterparts, thus a reduced dosage may be ideal for them. Due to its comparability in efficacy and safety to the Pritchard protocol, this research indicates that low-dose magnesium sulphate should be used instead.

Keywords: eclampsia, preeclampsia, PPH, CVA, HELLP

INTRODUCTION

In India, eclampsia is the leading cause of maternal death. Eclampsia's pathogenesis and therapy are both poorly known. Essential to the therapy of eclampsia is the prevention of seizure activity in preeclampsia and recurrent seizures in eclampsia. A variety of anticonvulsants are used to manage eclamptic fits and prevent further seizures. When it comes to treating eclamptic convulsions, magnesium sulphate (MgSO4) is the drug of choice since it reduces foetal and mother mortality and improves seizure control.[1,2] In terms of tried-and-true treatments, Pritchard's regimen is unrivalled in popularity. However, in thin and malnourished women from low and medium income countries, this 'high dose' regimen revealed several dose-related and potentially life-threatening toxicities, such as respiratory, renal, and neuromuscular dysfunction.[3,4] Women throughout the tropical globe have different body types, thus it was necessary to adjust the dosage used to treat eclampsia. Especially in India, women from the lower classes tend to be underweight compared to their global peers. Due to issues with accessibility, safety, expense, and religious oversight, Pritchard's regimen has been altered in several locations throughout India.[3-6] The MgSO4 dosage was adjusted and a standard operating procedure was developed to better serve the needs of our 40-60 kg Indian ladies.

MATERIALS AND METHODS

This research was conducted at the Department of Obstetrics and Gynecology, with clearance from the institute's ethical committee. Eclampsia patients were placed into two equal groups of 200. Groups 1 (Dhaka regime) and 2 (Pritchard regime). The trial excluded patients with myasthenia gravis, hepatic coma with danger of renal failure, and magnesium hypersensitivity.

METHODOLOGY

A thorough history, including age, parity, gestational age, number of convulsions, persistence of symptoms of pregnancy-induced hypertension, and H/o imminent signals, was gathered from close relatives as well as the patient if she is aware.

There was no prior history of hypertension (or) renal disease (or) eclampsia (or) eclampsia in a previous pregnancy. Scheduled patients had at least three prenatal visits, one in each trimester, and two doses of TT injection. A comprehensive general and obstetric checkup was performed. During the general examination, the conscious level, degree of oedema, anaemia, blood pressure pulse rate, temperature, respiration rate, cardiovascular system, respiratory system, and fundus examination were all done. All eclampsia-related examinations, such as renal function tests and liver functions, required the collection of blood and urine. Haematological tests were performed on all patients. The Regimen had been developed, and a life line had been constructed. Every hour, urine production was measured using an indwelling catheter. Half-hourly pulse, temperature, and respiration rate measurements were taken, as well as two-hourly blood pressure T readings. To treat hypertension, nifidipine 10mg was used three times daily. After the blood pressure was under control, the dose was reduced to 5mg twice day after 48 hours, and amlodipine 5mg was added OD. A complete obstetric examination was done when the patient was stabilised. The gestational age, viability of the baby, and cervical score all dictated the form of termination. Patients were first stimulated with prostaglandin E2 gel/Misoprostol, followed by ARM and Oxytocin infusions. Obstetric grounds (or) failure inductions necessitated a caesarean section. After delivery, the patient was intensively observed in the labour and post-operative wards for 48 to 72 hours before being released. The key outcome measure in both regimens is the recurrence of convulsions after starting medication.

4gm magnesium sulphate in a 20% solution given intravenously over 15 minutes as a loading dose. 3gm MgSo4 50% solution, injected intramuscularly in each buttock. 2.5gm intramuscularly in alternate buttocks every 4 hours until 24 hours after delivery. Urine output, knee jerks, and respiratory rate were all monitored in group 1. 4gm Magnesium sulphate (Mgso4, 7H2o, USP) in a 20% solution, given intravenously at a rate of no more than 1gm/min. 5gm deep IM in each buttock with 10gm of 50% Magnesium sulphate solution. For the next 24 hours after delivery, 5gm of 50% magnesium sulphate solution was given every 4 hours in group 2.

Statistical analysis

For statistical analysis, the SPSS 25.0 programme was employed. Tables with mean and percentages were used to show the data. A statistically significant p-value of 0.005 was used.

RESULTS

Table 1: Maternal parameters in group 1 and group 2

Maternal Parameters	Group 1	%	Group 2	%	P value
Age					
below 25	12	12	17	17	0.54
25-35	86	86	80	80	
above 35	2	2	3	3	
Parity					
Nulli	65	65	60	60	0.61
Primi	35	35	40	40	
BMI					0.44
Underweight	30	30	25	25	
Normal	52	52	52	52	
Overweight	18	18	23	23	
Type of eclampsia					0.74
Antepartum	80	80	90	90	
Post-partum	20	20	10	10	
No. of convulsions					
<3	30	30	30	30	
4 to 6	65	65	55	55	
7 to 10	5	5	15	15	
Mode of delivery					0.52
Vaginal	64	64	66	66	
Instrumental	9	9	7	7	
LSCS	27	27	27	27	

The majority of the patients (86%), were between the ages of 25 and 35. Approximately 65% were nulliparous, whereas 35% were multiparous. Approximately 30% were underweight, whereas 18% were overweight. Antepartum eclampsia was documented in 80% of instances, whereas postpartum eclampsia was reported in 20%. The majority of patients (about 65%) had 4 to 6 convulsions, 30% had 3 convulsions, and 5% had 7 to 10 convulsions. Vaginal birth was performed in 64% of the cases, LSCS was performed in 27% of the cases, and instrumental delivery was performed in 9% of the cases in both groups 1 and 2. The majority of patients (80%) were between the ages of 25 and 35. Around 60% of the women were nulliparous, whereas 40% were multiparous. Approximately 25% were underweight, whereas 23% were overweight. Antepartum eclampsia was documented in 90% of cases, while postpartum eclampsia was reported in 10%. The majority of patients (55% to 60%) had 4 to 6 convulsions, 30% had 3 convulsions, and 15% had 7 to 10 convulsions. Vaginal birth

was performed in 66% of instances, LSCS was performed in 27% of cases, and instrumental delivery was performed in 7% of cases.

Table 2: Recurrence of convulsions in group 1 and group 2

Recurrence of Convulsion	Group 1	%	Group 2	%
Without Recurrence	92	92	98	98
With one recurrence	2	2	1	1
With two recurrences	3	3	1	1
More than 2 recurrences	3	3	0	0

There was no recurrence in 92% of the cases, 3 recurrences in 3% of the cases, and more than 2 recurrences in 3% of the cases. In group 1, there were only two recurrences in 2% of the cases, and there were none in 98% of the instances. In group 2, there were one and one recurrence in 1% of the cases, respectively.

Table 3: Side effects of magnesium sulphate in group 1 and group 2

Side effects of Magnesium sulphate	Group1	%	Group 2	%
Flushing	15	15	30	30
Hypotension	5	5	9	9
Respiratory depression			3	3
Absent reflex			2	2
Injection Abscess formation	3	3	3	3
Total	23	23	47	47

Overall, 23% of the patients experienced side symptoms. In group 1, flushing was observed in 15% of the patients, hypotension in 5% of the cases, and injection abscess development in 3% of the cases, with total adverse effects recorded in 47% of the cases. Flushing was recorded in 30% of the patients, hypotension in 9% of the cases, injection abscess development in 3% of the cases, respiratory distress in 3% of the cases, and missing reflex in 2% of the cases in group 2.

Table 4: Maternal complications of eclampsia in group 1 and group 2

Maternal Complications	Group1	%	Group 2	%
CVA	1	1	1	1
Renal failure	0	0	3	3
HELLP Syndrome	9	9	9	9
Abruption	9	9	11	11
DIC	5	5	6	6
PPH	1	1	3	3
Total	25	25	33	33

Maternal problems were noted in 25% of the patients overall. HELLP syndrome and abruption were recorded in 9% of the cases each, DIC in 5% of the cases, PPH and CVA in 1% of the cases each in group 1, and total maternal problems in 33% of the cases. Abruption was recorded in 11% of the patients, HELLP syndrome in 8%, and DIC in 6%. Renal failure and PPH were observed in 3% of the patients, respectively, and CVA in 1% of the cases in Group 2. Maternal mortality was 3% overall. In 1% of the cases, CVA, DIC, and pulmonary oedema were the causes of death. Overall maternal mortality was 8% in groups 1 and 2. In 3% of instances, DIC and acute renal failure were the causes of maternal death, whereas pulmonary oedema and CVA were the causes of mortality in 1% of cases.

DISCUSSION

In pregnant women, eclampsia is a leading cause of convulsions. Constant challenges with eclampsia persist in low-income nations. [7] Depending on the country, the worldwide incidence of eclampsia is anything from 1 in 100 to 1 in 1 700. [8] Eclampsia is still a significant health concern in India, as it is in many other developing nations. The emergency medical condition known as eclampsia remains a leading cause of maternal morbidity and death worldwide. There are 12% of maternal fatalities worldwide due to eclampsia, and 8% in India. [9] Evidence from the Collaborative Eclampsia Trial indicates that magnesium is superior than diazepam and phenytoin in reducing the risk of future seizures. [10] Furthermore, there seems to be no ill effects on the neonate from using magnesium sulphate. Brain vasospasm and ischemia have been linked to eclampsia development, as shown by CT and MRI brain scans. Magnesium seems to mitigate and even reverse the effects of cerebral ischemia. Magnesium may have a little inhibiting effect on cortical discharge due to its antagonism of the excitatory glutamate N- methyl aspartate receptor.[11]

Forty-five percent of N.W.M. Hospital's patients were younger than 20, 56.8 percent were between the ages of 21 and 29, and just 2.7 percent were older than 30.[12] The majority of patients (87%) in the research by Ranjana et al. were young adults (aged 21-30). According to research by Katz et al. [13] the average age of eclampsia cases in the USA was 22. It is worth noting that the majority of patients in this research were between the ages of 25 and 35, just as they were in the aforementioned study.[14] A majority (almost 75%, according Mudhaliar) were first-time users. Fifteen of the patients in both the Dhaka regimen and Pritchard regimen groups were first-time HIV-positive test takers in this research.[15]

From the data collected by the Collaborative Eclampsia Trial Group, we learn that 39.5% of cases were recorded before 34 weeks, 25.5% between 34 and 36 weeks, and 33.5% at term. Mean gestational age was 33.01 weeks for those assigned to the Dhaka regimen and 33.42 weeks for those assigned to the Pritchard regimen. In the trial conducted by Dommisse et al., there was no recurrence of convulsions. [16] At PGI Chandigarh, 8.1% of patients survived after starting the treatment, compared to 16% in the Collaborative Eclampsia Trial Group study.[17] Eight percent of the patients in the Dhaka regimen group and two percent of the Pritchard regimen group reported recurrent convulsions in the present research. Only 25% of pregnancies were found to be without any difficulties. HELLP syndrome and abruption accounted for 9% of cases, DIC for 5%, and PPH and CVA for 1% each. In the United States, 6 percent of maternal deaths were caused by eclampsia. The Collaborative Eclampsia Trial Group found that magnesium sulphate reduced maternal mortality to 3.8%. According to this study, the maternal mortality rate during the Dhaka rule was 3%.

CONCLUSION

There was no statistically significant difference between the groups in the rates of maternal complications or maternal death. Women in India tend to have a lower body mass index than their Western counterparts, thus a reduced dosage may be ideal for them. Due to its comparability in efficacy and safety to the Pritchard protocol, this research indicates that low-dose magnesium sulphate should be used instead.

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