Int J Biol Med Res. 2013; 4(2) :3001- 3004

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International Journal of Biological & Medical Research

Journal homepage: www.biomedscidirect.com

Original Article

acomparative study of low dose magnesium sulphate regime and pritchard regime for imminent eclampsia and eclampsia.

[a]K.Omkara Murthy, [b]U.N . Shobha, [c]B.S. Dhananjaya, [d]Sameena Sultana

[a]Assistant professor, Sri Siddhartha medical college and Research centre,Tumkur- 572107.
[b]Assistant professor, Sri Siddhartha medical college and Research centre, Tumkur – 572107.
[c]Professor, Sri Siddhartha Medical College, Tumkur – 572107.
[d]Senior Resident, Sri Siddhartha medical college and Research centre,Tumkur – 572107

ARTICLE INFO

Keywords:
Eclampsia
Imminent eclampsia
Magnesium sulfate
Nifedipine

ABSTRACT

Aim: To Study the effectiveness, side effects and maternal and perinatal outcome using low dose MgSO4 in comparison with the standard Pritchard regimen. Objective: 1) To study the efficacy of low dose MgSo4 regime for control of convulsions in eclampsia and as seizure prophylaxis in imminent eclampsis. 2) To study the maternal and perinatal outcome in these patients. 3) To study the side effects of MgSo4 in both the groups. 4) To compare the results with that of the Pritchard regimen. Study design: This prospective randomized control study was conducted between Aug 2005 to July 2007 at department of OBG, JIPMER, Puducherry. This study was done to evaluate the safety and efficacy of low dose MgSo4 as compared to the standard Pritchard regimen. Total number of patients included in this study was 170. Two groups were made consisting of 85 cases in each group as group I (control) and group II (study). Each group had 50 eclampsia cases and 35 imminent eclampsia cases. Results are analysed using chi square test and independent t test. Result: The groups were compared with respect to age, gravidity, gestational age, antenatal care, type of eclampsia, need of antihypertensive therapy, dose of MgSO4 received, complications during MgSO4 therapy, number of convulsions and perinatal mortality, blood pressure at discharge. Antepartum eclampsia was the commonest , the mean amount of MgSO4 received was 30.60gm and 19.35gm in group I and II with eclampsia and 25.5gm , 14.8gm in group I and II with imminent eclampsis respectively and was statistically significant with a pvalue < 0.001% . Perinatal mortality in patients with 6 to 10 convulsions is higher with Pritchard regime compared to low dose with p value < 0.0004. Conclusion: Low dose magnesium sulfate is as effective as conventional full dose Pritchard regime with lesser side effects and equally good perinatal outcome.

1. Introduction

Hypertension disorder complicating pregnancy form one of the deadly triad along with hemorrhage and infection that results in a large number of maternal deaths. The exact causes of pre eclampsia are not known, though the pathophysiology has been understood better over the past half century to make treatment more scientific and evidence based.

In 1966 Zuspan and Ward wrote "The eclamptic patient has certainly tested the skill of physician throughout the centuries as she has been bled , blistered , purged , packed , irrigated , punctured , paralyzed , starved , anesthetized and tranquilized and rendered hypotensive and has been given diuretics , has been dehydrated and forcibly delivered and neglected."[1]

Currently the most commonly used regimens of magnesium sulfate administration are the standard intramuscular (IM) regimen of Pritchard(1975) [2,3,4,5] and the intravenous regimen of Zuspan (1978) [1] and Sibai (1990) [6,7,8,9,10,11]. Pritchard suggested that the dose of magnesium sulfate should be limited in women who are known to be or appear to be small . With this in

* Corresponding Author :
Email:drshobhaun2007@yahoo.co.in

mind the dose of regime of magnesium sulfate can be modified and a standard protocol can be formulated to suit our Indian women who on an average weigh much less than their counterparts in the western world.

2. Materials and Methods

This is a prospective randomized control study conducted in patients admitted to the Department of Obstetrics and Gynecology of JIPMER, Puducherry between August 2005 to July 2007.

Totally 170 patients were included in which group (control) had 50 eclampsia and 35 imminent eclampsia cases, group (study) also had 50 eclampsia and 35 imminent eclampsia cases.

2.1. Inclusion criteria

· All cases of eclampsia (Ante partum / Intrapartum / Intercurrent).

· All cases of imminent eclampsia (hypertension with frontal headache, epigastric pain, vomiting and blurring of vision)

2.2. Exclusion criteria

· Post partum eclampsia.

· Other cases of convulsions like epilepsy, cerebrovascular accidents, rupture of aneurysm, meningitis, encephalitis, cerebral tumors, hyperventilation syndrome, and metabolic abnormalities.

· Patients already treated outside with magnesium sulfate.

· Those who were deeply unconscious with CVA, renal failure (severe oliguria or anuria), massive pulmonary edema, associated massive hemorrhage, DIC and shock (including sepsis).

2.3. Dosage, regimens and medications

Group I (control) patient's received magnesium sulfate by Pritchard regimen and group II (Study) patients received magnesium sulfate as advocated by Begum et al.,[12,13] in 1998 at Dhaka Medical College, Bangladesh.

Group I(Control)
A.Eclampsia

a) LOADING DOSE : Magnesium sulfate 4gm intravenous in dilution (dissolve 4 ampoules of 50% MgSo4 in 12cc of distilled water so as to make 20 cc of 20% solution) over 4-5 minutes, followed by 10gm deep i.m (5gm into each buttock).

b) MAINTENANCE DOSE: 5gm i.m into alternate buttock 4th hourly till 24 hrs after delivery / last convulsion whichever was later.

B.Imminent eclampsia

a) LOADING DOSE : 10gm deep i.m (5gm into each buttock)

b) MAINTENANCE DOSE: 5gm i.m into alternate buttock 4th hourly till 24 hrs after delivery / till premonitory symptoms and signs disappeared.

GROUP II (Study)

A. Eclampsia

a) LOADING DOSE : Magnesium sulfate 4gm intravenous in dilution (as above) over 4-5 minutes, followed by 6gm deep i.m (3gm into each buttock).

b) MAINTENANCE DOSE : 2.5gm i.m into alternate buttock 4th hourly till 24 hours after delivery /last convulsion whichever was later.

B.Imminent eclampsia

a) LOADING DOSE : 6gm deep i.m (3gm into each buttock).

b) MAINTENANCE DOSE : 2.5gm i.m into alternate buttock 4th hourly till 24 hours after delivery/ till premonitory symptoms and signs disappeared.

3. Results

TABLE 1 shows Ante partum eclampsia was the commonest eclampsia with an incidence of 92% in Group I and 90% in Group II and there was no statistically significant difference. Two patients in low dose regimen had intercurrent eclampsia.

TABLE 1- Type of Eclampsia

Type of Eclampsia	Eclampsia			
	Group I	%	Group II	%
Antepartum	46	92	45	90
Intra-partum	4	8	3	6
Intercurrent	0	0	2	4
TOTAL	50	100	50	100

TABLE 2 shows 72% received antihypertensive therapy in eclampsia and 74.3% in imminent eclampsia group.

TABLE 2- Antihypertensive Therapy

Antihypertensive agents	Eclampsia				Imminent Eclampsia			
	Group I	%	Group II	%	Group I	%	Group I	%
Nifedipine only	36	72	36	72	31	88.6	26	74.3
Additional Antihypertensive	10	20	5	10	4	11.4	4	11.4
No Antihypertensive	4	8	9	18	0	0	5	14.3
P Value		0.166				0.06		

TABLE 3 shows that the mean amount of magnesium sulfate received was 30.60 gm and 19.35gm in Group I and Group II respectively in patients with eclampsia and was statistically significant with a p value <0.001.The mean dose in patients with imminent eclampsia was 25.6gm and 14.8gm in Group I and II respectively and was statistically significant with a p value<0.001.

TABLE 3- Dose of Magnesium Sulfate Received

Total dose (gms)	Eclampsia				Imminent Eclampsia			
	Group I (50)	%	Group II (50)	%	Group I (35)	%	Group II (35)	
<15	5	10	12	24	3	88.6		
16-25	12	24	38	76	11	11.4		
26-35	25	50	0	0	21	0		
>36	8	16	0	0	0	0.06		
	30.60		19.35					
P value		<0.001				<0.001		

TABLE 4 shows in patients with eclampsia loss of knee jerk was seen in 16%in Group I and was seen in only 8% in Group II and was not statistically significant with a p value of 0.35. Respiratory depression was seen in 2% of the patients in Group I and none in Group II. There were two cases with recurrence of fit in Group I and one case in Group II and was not statistically significant. In patients with imminent eclampsia loss of knee jerk was seen in 8.6% of the patients in Group I and 2.9% of the patients in Group II and was not statistically significant. There was no case of respiratory depression in any of the groups and one case of occurrence of fit in Group II.

TABLE 4 – Complications during Magnesium Sulfate Therapy

Complications	Eclampsia					Imminent Eclampsia				
	Group I (50)	%	Group II (50)	%	p	Group I (50)	%	Group II (50)	%	p
Loss of Knee jerk	8	16	4	8	0.35	3	8.6	1	2.9	0.61
Respiratory depression	1	2	0	0	1	0	0	0	0	1
Recurrence/ occurrence of fit	2		1	2	1	0		1	2.9	
Total	11/50		5/50			3/35		2/35		

TABLE 5 shows that perinatal mortality in patients with 6-10 convulsions who received Pritchard regimen (HDR) was significantly higher compared to low dose regimen with a p value <0.0004.

TABLE 5 – Number of Convulsions and Perinatal Mortality (LDR)

No of convulsions	Number of patients	Live birth	Still birth	Early neonatal death	PNMR
1-5	44	36	8	2	22.7%
6-10	4	3	1	1	50%*
>10	2	1	1	0	50%

***p value < 0.0004**

TABLE 6 shows the mean blood pressure at the time of discharge was 84 mm Hg in Group I with eclampsia and 82 mm Hg in Group II and the difference was not statistically significant. In patients with imminent eclampsia the mean blood pressure was 82 mm Hg in Group I and 84 mmHg in Group II and the difference was not statistically significant.

TABLE 6 – Blood Pressure at Discharge

Diastolic BP (mmHg)	Eclampsia				Imminent Eclampsia			
	Group I	%	Group II	%	Group I	%	Group II	%
<80	31	62	41	82	25	71.4	20	57.1
81-90	19	38	09	18	10	28.6	15	42.9
Total	50	100	50	100	35	100	35	100

4. Discussion

Results of present study showed that antepartum eclampsia was the commonest eclampsia with 95% followed by intrapartum being 7%.In a study conducted by Pritchard's , Menon[14] ,Sibai ,Begum et al [12,13] antepartum is the commonest followed by intrapartum . In our study 14.3% in group 2 did not receive any hypertensive and Nifedipine was used in 88.6% of cases in Pritchard's regimen and 74.3% cases in low dose regimen.

The yardstick used to measure the efficacy of magnesium sulfate was the number of convulsions that occurred after the patient was started on magnesium sulfate. There was one case of recurrence of convulsions in low dose regimen and two cases of recurrence in Pritchard regimen after the loading dose, which was controlled in all the cases by an additional 2gm of magnesium sulfate. Sibai et al in 1981[10] reported recurrence rate of 1% out of 1158 patients who received magnesium sulfate by Pritchard regimen. Pritchard et al after a study between 1975-83 reported 12.1% recurrence in 83 patients treated by magnesium sulfate. Sibai et al in 1990 [11] reported 14.2% recurrence using Pritchard regimen. In eclampsia collaborative trial (1995) recurrence rate was 5.7%. In a study by sardesai et al, (1998) the recurrence rate was 7.89% with low dose regimen. In a study by Begum et al [12, 13], (1998) there was one case of recurrence out of 65 patients who received low dose magnesium sulfate. In the present study, in patients with imminent eclampsia who received low dose magnesium sulfate one patient had convulsions (2.9%) inspite of prophylaxis. Sardesai et al in 1998 also reported a similar incidence of 1.25% in their study of 474 patients.

On the basis of the above observations, it seems that the control of convulsions in eclampsia and prevention of convulsions in imminent eclampsia can safely be achieved in majority of women in low dose magnesium sulfate. Toxicity of

Magnesium sulfate – maternal as well as neonatal, was found to be less in low dose magnessium sulfate. From these observations it seems that use of lower dose of magnesium sulfate can be safely extended to peripheral institutions where facilities for proper monitoring are lacking.

5. Conclusion

Low dose magnesium sulfate is as effective as conventional full dose Pritchard regime with lesser side effects and equally good perinatal outcome.

Acknowledgement

Mere thanks in few words would be highly inadequate to express my thanks to my professor Dr.NANDAGOPAL .K.M. M.D., D.G.O., Head of the department, SSMC, Tumkur, Dr. Dhananjaya B.S.,Chief, Obstetrics and gynecology, SSMC, Tumkur, for preparing us to complete this task.

We are highly indebted to Professor Dr.Shivaprasad G, Director, Sri Siddhartha Medical College, Tumkur, for his great care, valuable guidance and constant encouragement. Funding for this project was done by Dr.Omkara murthy K and Dr. Shobha U.N.

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