A Comparative study of The Effectiveness of Low Dose Magnesium Sulphate v/s Standard Pritchard Regimen in Eclampsia & Imminent Eclampsia in Indian Women

[1]Asmita Nayak, [2]Shahnaz Chanded, [3]Suniti Verma, [4]Kamlesh Yadav, [5]K.C. Nayak
[1&2]Senior Resident, Department of Obstetrics & Gynae, P.B.M. Hospital, Bikaner, Rajasthan
[3]Professor, Deptt. of Obs & Gynae, Janana Hospital, SMS Medical College, Jaipur, Rajasthan
[4]Professor, Deptt. of Obs & Gynae, S.P. Medical College & AG Hospital, Bikaner, Rajasthan
[5]Senior Professor, Deptt. of Medicine, S.P. Medical College & AG Hospital, Bikaner.

ABSTRACT
Objective: Eclampsia is still a common obstetric emergency, minimum doses of magnesium sulphate, which gives efficient control of convulsions and helps in improving maternal and fetal outcome. **Material & Methods:** The prospective hospital based study was conducted in S.P. Medical College, Bikaner, Rajasthan. The subjects were divided into two groups on the basis of standards and the low dose regime of $MgSO_4$. Group I (control) patient received magnesium sulphate by Pritchard regimen and Group II (case) patient received low dose magnesium sulphate. **Results:** The our results show the perinatal mortality was present in total 24 babies and out of them 14 and 10 belonged to study and control groups respectively and the difference was also found statistically insignificant ($p>0.05$). **Conclusion**: Low dose magnesium sulphate appeared to be sufficient to control and prevent convulsion effectively in eclampsia and imminent eclampsia.
KEY WORDS: Eclampsia, Magnesium Sulphate, Morbidity, Mortality

Corresponding Author: Dr. Asmita Nayak, Senior Resident, Department of Obstetrics & Gynae, P.B.M. Hospital, Bikaner, Rajasthan, Mail: nayakdoctor9@gmail.com

INTRODUCTION

Eclampsia (Greek for "shining forth") is an acute and life-threatening complication of pregnancy, characterized by the appearance of tonic-clonic seizures, usually in a patient who has developed pre-eclampsia. (Pre-eclampsia and eclampsia are collectively called "hypertensive disorder of pregnancy" and "toxemia of pregnancy".) Eclampsia includes seizures and coma that happen during pregnancy but are not due to pre-existing or organic brain disorders.[1] Pre-eclampsia/eclampsia (PE/E) is a life-threatening multisystem disorder affecting 2-8% of all pregnancies worldwide[2,3] that has a substantial effect on maternal and newborn health. PE/E is one of the most common causes of maternal and perinatal morbidity and mortality in low and middle income countries.[4] Globally, approximately 63,000 women die each year of PE/E which accounts for an estimated 9% of maternal deaths in Asia and Africa and about one-quarter of maternal deaths in Latin America and the Caribbean.[2,4-7] Manifestations of severe pre-eclampsia should be treated in accordance with World Health Organization recommendations.[8] Comprehensive management of the disease includes vigilant monitoring of the woman and fetus, management of acute hypertension and prevention of seizures in women with pre-eclampsia, and prevention of recurrent seizures in women with eclampsia. The definitive treatment

of PE/E is delivery of the fetus.

Magnesium sulphate is the drug of choice for prevention of seizures in the pre-eclamptic woman, or prevention of recurrence of seizures in the eclamptic woman, as demonstrated in two large clinical studies. In 1995, the Eclampsia Trial Collaborative Group reported that when magnesium sulphate was used for treatment the risk of recurrent convulsions in women with eclampsia was reduced by 52% when compared with diazepam, and by 67% when compared with phenytoin.[9] Eclampsia is a major cause of maternal and perinatal morbidity and mortality. Transient neurological deficit is common, but persistent deficits are rare. Renal failure complicating eclampsia may result in prolonged renal insufficiency. Eclampsia accounted for 67.2% of obstetric causes of acute renal failure requiring dialysis.[10] The first principle in the management of eclampsia is the control of convulsions. On the basis of the available evidence, The World Health Organization (WHO) has recommended $MgSO_4$ as the most effective, safe, and low-cost drug for the treatment of severe pre-eclampsia and eclampsia.[11] Considering the low body mass index of Indian women, a low dose magnesium sulphate regime has been introduced by some authors. Pritchard suggested that the dose of magnesium sulphate should be limited in women who are known to be or appear to be small. With this in mind the dose of a regime of magnesium sulphate can be modified and a standard protocol can be formulated to suit our Indian women whom an average weight much less than their counterparts in the western world.[12,13,14] The aim of the present study to effectiveness of low dose magnesium sulphate in control of convulsions in eclampsia & prevention of convulsions in imminent eclampsia.

MATERIAL & METHODS

The prospective hospital based study was conducted in the department of Obstetrics and Gynecology, P.B.M and Associated Group of Hospitals, attached to Sardar Patel Medical College, Bikaner tertiary hospitals during the study period of one year from January 2014 to December 2014.

Inclusion Criteria

1. All cases of eclampsia (Antepartum / Intrapartum /Intercurrent).
2. All cases of imminent eclampsia (hypertension with frontal headache, epigastric pain, vomiting and blurring of vision).

Exclusion criteria

1. Patients who had received anticonvulsant treatment before admission to the hospital.
2. Post-partum eclampsia.
3. Patients already treated outside with magnesium sulphate.
4. Those who presented with complications like renal failure, HELLP Syndrome, DIC, shock, massive pulmonary edema.
5. Other causes of convulsions like epilepsy, meningitis, encephalitis and cerebrovascular accident (CVA), metabolic abnormalities.

Study Tools:

A semi-structured pre-tested proforma was used for collection of information. The subjects were divided into two groups on the basis of standard and the low dose regime of $MgSO_4$.

Group I (control) patient received magnesium sulphate by Pritchard regimen.

Group II (case) patient received low dose magnesium sulphate.

Group I (control)

1. Eclampsia

a. Loading dose: Magnesium sulphate 4gm intravenous in dilution over 4-5 minutes, followed by 10gm deep IM (5gm into each buttock).

b. Maintenance dose: 5gm IM into alternate buttock 4 hourly till 24 hrs after delivery / last convulsion whichever was later.

2. Imminent Eclampsia

a. Loading dose: 10gm deep IM (5gm into each buttock)

b. Maintenance dose: 5gm IM into alternate buttock 4 hourly till 24 hrs after delivery/till premonitory symptoms and signs disappeared.

Group II (Case)

1. Eclampsia

a. Loading dose: Magnesium sulphate 3gm intravenous in dilution (as above) over 4-5 minutes, followed by 5gm deep IM (2.5 gm into each buttock).

b. Maintenance dose: 2.5gm IM into alternate buttock 4 hourly till 24 hours after delivery /last convulsion whichever later.

2. Imminent Eclampsia

a. Loading dose: 5gm deep IM (2.5 gm into each buttock).

b. Maintenance dose: 2.5 gm IM into alternate buttock 4 hourly till 24 hours after delivery/till premonitory symptoms and signs disappeared.

All women were monitored by clinical parameters, i.e. the knee jerk (should be present), respiratory rate (should be more than 16/minute), and urine output (should be more than 25 ml/HR) during the maintenance period. If any toxicity was noted, then next dose of $MgSO_4$ was withheld & the toxicity was managed with calcium gluconate infusion. The approval of the hospital's ethics is obtained prior to the commencement of study. Informed consent was obtained from each woman recruited into the study. All cases were managed according to the departmental protocol and follow up clinically until they were discharged.

RESULTS

In the present study, maximum number of females (108) had their gestational age >34 weeks and out of them 57% and 51% belonged to study and control group, respectively, while 54 females had their gestational age ≤30 weeks and 38 females had their gestational age between 31-34 weeks and this difference was also found statistically insignificant ($p>0.05$) (Table-1). According to diagnosis, EPT pregnancy with IE was present in 9% females of the study group and 7% females of control group, EPT with eclampsia was present in 20% and 24% females of study and control groups respectively (table no. 2).

The our results show (Table-3) the perinatal mortality was present in total 24 babies and out of them 14 and 10 belonged to study and control groups respectively and the difference was also found statistically insignificant ($p>0.05$) and maternal mortality was present in total 9 females and out of them 6 and 3 belonged to study and control groups respectively (Table-4).

DISCUSSION

Eclampsia is a common cause of maternal mortality worldwide, but particularly in the developing countries. It is estimated that every year eclampsia is associated (~ 10% of MMR) worldwide, most of which occur in developing countries.[15] Magnesium sulphate is the

drug of choice for prevention of seizures in the pre-eclamptic woman, or prevention of recurrence of seizures in the eclamptic woman. It has been established that magnesium sulphate is the anticonvulsant of choice for both prevention and treatment of eclampsia. $MgSo_4$ in the Pritchard regime is associated with dose-related toxicity. Potential hazards include maternal hypotension, respiratory depression, and respiratory arrest (cardiac arrest is rare). Undue apprehension regarding these hazards leads to a limited use of the drug in many low-income countries.

Despite the compelling evidence for the effectiveness of magnesium sulphate concern has been expressed about the safety of its administration and use, particularly in clinical environments where the capacity for patient monitoring is limited. These concerns can constrain initiation of treatment for all women with indicated need, or may impede sustaining therapy over the recommended timeline established for the particular regimen, once treatment has been initiated.[16,17] Our study also favored in prospective randomized controlled study was conducted in the department of Obstetrics & Gynaecology, JIPMER[18] Puducherry to find out low dose magnesium sulfate is as effective as conventional full dose Pritchard regime with lesser side effects and equally good perinatal outcomes. In our study maternal mortality was found in total 9 females and out of them 6 and 3 belonged to study and control group respectively. Our results are also similar to study carried out at a tertiary care center in a rural area in 2009.[19]

CONCLUSION

Considering to our Indian women whom an average weight much less than their counterparts in the western world. Low dose magnesium sulphate appeared to be sufficient to control and prevent convulsion effectively in eclampsia and imminent eclampsia. Maternal and perinatal morbidity and mortality in the present study were comparable to those of the standard Pritchard regime. Magnesium sulphate's narrow therapeutic range mandates that it only be used in the minimum doses which gives efficient control of convulsions and helps in improving maternal and fetal outcome.

Conflict of Interest: None.

Source of Funding: Nil.

Reference:

1. Chesley LC. Hypertensive Disorders in Pregnancy. Williams Obstetrics, 14th Ed. New York, Appleton Century Crofts, 1971;700.
2. Ghulmiyyah L, Sibai B. Maternal mortality from preeclampsia/ eclampsia. Sem Perinatol 2012;36:56–59.
3. Steegers EA, VonDadelszen P, Duvekot JJ, Pijnenborg R. Pre-eclampsia, Lancet. 2010;376:631-44.
4. Duley L. Maternal mortality associated with hypertensive disorders of pregnancy in Africa, Asia, Latin America and the Carribbean. Br J Obstet Gynaecol. 2005;99:533-47.
5. Duley L. The global impact of pre-eclampsia and eclampsia. Semin Perinatol. 2009; 33:130-37.
6. Garcia PVD. Maternal deaths due to eclampsia and HELLP syndrome. Int J Gynecol Obstet. 2009;104:90-94.
7. Khan KS, Wojdyla D, Say I, Gúlmezoglu AM, Van Look PF. WHO analysis of causes of maternal death: a systematic review. Lancet 2006; 367(9516):1066-74.
8. World Health Organization: WHO Recommendations for Prevention

and Treatment of Pre-eclampsia and Eclampsia. Geneva; 2011. Available on **http://whqlibdoc**. who.int/publications/2011/9789241 548335_ eng.pdf. Retrieved on 18th January 2016.

9. Eclampsia Trial Collaborative Group: Which anticonvulsant for women with eclampsia? Evidence from the collaborative eclampsia trial. Lancet 1995;345:1455-63.
10. Miquil M, Salmi S, Moussaid I, Benyyournes R. Acute renal failure requiring dialysis in Obstetrics. Neprol Theor. 2011;7(3):178-81.
11. World Health Organization. Mother baby package: Implementing safe motherhood in countries. Geneva: WHO; 1994.
12. Flower CA. Magnesium sulphate in toxemia of pregnancy-New dosage schedule based on body weight J.Obstet Gynecol. l962;19:315.
13. Suman S, Shivanjali M, Ajit P. Low dosemagnesium sulphate therapy for eclampsia and imminent eclampsia-Regime tailored for Indian women. J. Obstet Gynecol. 2003; 53(6):546-50.
14. Begum R, Begum A, Johnson R. A low dose (Dhaka) magnesium sulphate regime for eclampsia. Acta Obstetricaet Gynecologica Scandiriavica. 2001;80(11):998-1002.
15. Duley L. Maternal mortality associated with hypertensive disorders of pregnancy in Africa, Asia, Latin America and the Caribbean. Br J Obstet Gynaecol. 1992;99:547-53.
16. Barua A, Mundle S, Bracken H, Easterline T, Winikoff B. Facility and personnel factors influencing magnesium sulphate use for eclampsia and pre-eclampsia in 3 Indian hospitals. Int J Gynecol Obstet. 2011;115(3):231–234.
17. Firoz T, Sanghvi H, Merialdi M, von Dadelszen P: Pre-eclampsia in low and middle income countries. Best Pract ResClin Obstet Gynaecol. 2011;25:53-548.
18. Murthy KO, Shobha UN, Dhananjaya BS, Sultana S, A comparative study of low dose magnesium sulphate regime and Pritchard regime for imminent eclampsia and eclampsia. Int J Biol Med Res. 2013;4(2):3001-04.
19. Bengal V, Kwatra A, Raghav S, Jadhav S. Low dose magnesium sulphate regime for eclampsia. Pravara Med Rev. 2009;1(3):14-15.

Table 1:Distribution of cases, according to gestational age

Gestational Age (weeks)	Group				Total	
	Study		Control			
	No.	%	No.	%	No.	%
≤30	27	27.0	27	27.0	54	27.0
31-34	16	16.0	22	22.0	38	19.0
>34	57	57.0	51	51.0	108	54.0
Total	100	100	100	100	200	100
Mean±SD	33.88±3.18		34.07±3.10			
P	0.669					

Table 2: Distribution of cases, according to diagnosis

Diagnosis	Group				Total	
	Study		Control			
	No.	%	No.	%	No.	%
EPT Pregnancy with IE	9	9.0	7	7.0	16	8.0
EPT with Eclampsia	20	20.0	24	24.0	44	22.0
IUD with Eclampsia	1	1.0	0	-	1	0.5
LPT Pregnancy with IE	38	38.0	30	30.0	68	34.0
LPT with Eclampsia	19	19.0	18	18.0	37	18.5
Term Pregnancy with IE	7	7.0	21	21.0	28	14.0
Term with Eclampsia	6	6.0	0	-	6	3.0
Total	100	100	100	100	200	100
χ^2	15.582					
P	0.016					

Table 3: Distribution of cases, according to perinatal mortality

Perinatal Mortality	Group				Total	
	Study		Control			
	No.	%	No.	%	No.	%
No	86	86.0	90	90.0	176	88.0
Yes	14	14.0	10	10.0	24	12.0
Total	100	100	100	100	200	100
χ^2	0.758					
P	0.384					

Table 4: Distribution of cases, according to maternal mortality

Maternal Mortality	Group				Total	
	Study		Control			
	No.	%	No.	%	No.	%
No	94	94.0	97	97.0	191	95.5
Yes	6	6.0	3	3.0	9	4.5
Total	100	100	100	100	200	100
χ^2	0.758					
P	0.306					