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4G Intravenous Magnesium Sulphate in Severe Preeclampsia For Prevention of Eclampsia

KEYWORDS: Preeclampsia, magnesium sulphate, convulsion

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ABSTRACT *Pre-eclampsia is defined as a multi-system disorder of pregnancy presenting as raised blood pressure plus proteinuria. Preeclampsia complicates 2–8% of pregnancies. We have studied 100 patients with severe preeclampsia who have been given 4g intravenous MgSo4 on admission. The loading dose is prepared by diluting 4gm of MgSO4 in 12ml sterile water given over 5-10mins slowly with strict vitals monitoring and FHS monitoring. All patients of severe pre-eclampsia with B.P>160/110mm of Hg &/or associated with any of the premonitory signs and symptoms were given this dose. We monitored the patient till she delivered with daily B.P, urine output; urine albumin and FHS record were maintained strictly. Incidence of convulsions was 3% in my study. Perinatal outcome was excellent with 94 live births. Single loading dose of magnesium sulphate is an efficient prophylactic in preventing eclampsia, with a success rate of 97%.*

INTRODUCTION:
Hypertension is the most common medical disorder during pregnancy. ("Report of the National High Blood Pressure Education Program," 2000) Approximately 70% of women diagnosed with hypertension during pregnancy will have mild preeclampsia. The term "PIH"(pregnancy induced hypertension) is used to describe a wide spectrum of patients who may have only mild elevation in blood pressure (BP) or severe hypertension with various organ dysfunctions cerebral dysrhythmias leading to convulsions (eclampsia), encephalopathy, renal failure, cardiac failure or liver failure and hemolysis, elevated liver enzymes, low platelets (HELLP) syndrome. The incidence of gestational hypertension & preeclampsia in India is between 8-10%.

Available clinical and research evidence goes in favor of magnesium sulphate, taking it to the top slot compared to diazepam and phenytoin, as an anticonvulsant. Though it was first used in 1966 by Horn, the main credit for popularizing it goes to Pritchard (1955). He introduced the combined intravenous and intramuscular regimen with loading and maintenance schedules. The **Magpie trial** (2006) was a randomized, placebo-controlled study that enrolled over 10,000 women in 33 countries that confirmed the efficacy of MgSO4 in the treatment of severe preeclampsia and eclampsia. Women treated with MgSO4 had a 52% and 67% lower recurrence of convulsions than those treated with diazepam and phenytoin, respectively. The effect of MgSO4 on perinatal outcomes was also studied, demonstrating significantly improved outcomes for newborns compared to phenytoin.

We have studied 100 patients with severe preeclampsia who have been given 4g intravenous MgSo4 on admission to prevent convulsions and these patients were observed till 2 weeks after delivery. Since eclampsia is more common in rural population, where there is insufficient antenatal care and lack of medical personnel, the idea of single loading dose which does not require intense monitoring is worth considering. The overall effort needed for close continuous monitoring of a common obstetric problem like pre-eclampsia and the monitoring staff allotted exclusively for such patients could as well be an avoidable burden.

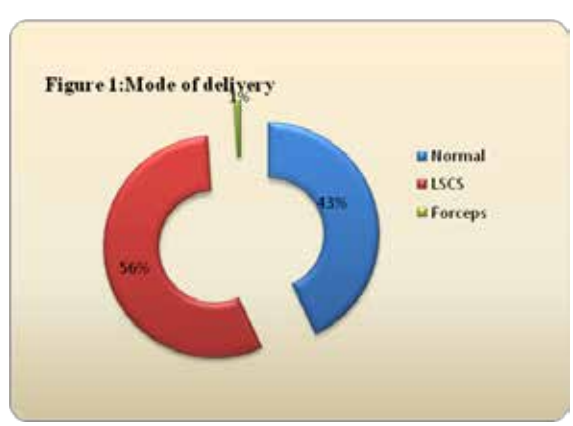
MATERIAL & METHODS:
The study included 100 antepartum patients with severe preeclampsia admitted in ward or labour room. It was conducted from August 2011 to August 2013 at Bharati Medical College, Pune. All patients of severe pre eclampsia with B.P>160/110mm of Hg &/or associated with any of the premonitory signs and symptoms such as nausea/vomiting/blurring of vision etc. were included in the study and were given Injection MgSo4 4g intravenously on admission.

The loading dose was prepared by diluting 4gm of MgSO4 in 12ml sterile water given over 5-10mins slowly with strict vitals monitoring and FHS monitoring.

These patients were subjected to detailed history, clinical examination and specific investigations {Complete hemogram, Urine analysis for proteinuria, sugar and microscopy, PIH profile-LFTs, RFTs, Serum electrolytes, Serum LDH, PT/APTT, Evidence of hemolysis in peripheral blood smear , obstetric ultrasound & colour doppler}

We monitored the patient till she delivered. Her daily B.P, urine output, urine albumin and FHS record were maintained strictly. We also observed for any development of premonitory signs and symptoms.

RESULT:
- It was observed that most patients in the study were between the age group of 21 years to 25 years.
- Most of the patients were primi para (59%). Distribution of patients in relation to their gestational age showed that 39 patients were from gestational age of 36 weeks or more; and 34 patients were between the gestational age of 33weeks and 36 weeks.



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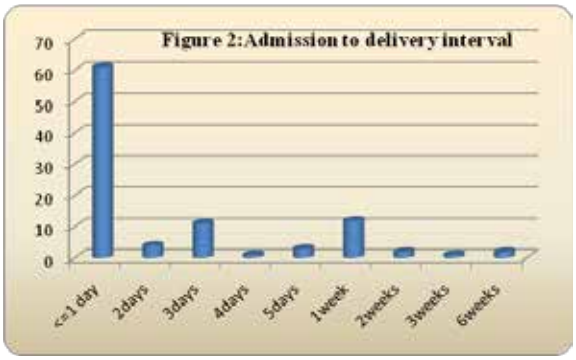

Table 1: Incidence of convulsions

Convulsions	Frequency	Percent
Yes	3	3
No	97	97
Total	100	100

Table 2: Clinical profile of patients who had convulsions

Patient	A	B	C
Type of eclampsia Antepartum Intrapartum Postpartum	 1 - -	 - - 1	 - - 1
Gestational age	38weeks	32 weeks	32 weeks
Number of convulsions	1	1	1
B.P on admission	180/130 mm of Hg	180/130 mm of Hg	170/110 mm of Hg
Urinary proteins	3+	4+	4+
Treatment to first convulsion interval	6hours	26 hours	14 hours
Delivery to convulsion interval	1hour	14hours	8hours

DISCUSSION:
The primary objective of MgSo4 prophylaxis in women with severe preeclampsia was to prevent or reduce the rate of eclampsia. The secondary benefit of this drug was to reduce maternal and perinatal mortality and morbidity. In the present study, gravida distribution shows maximum incidence of preeclampsia with primigravida patients (59%).

Most of the patients in this study were with a gestational age more than 36 weeks (39%).

All patients who were admitted as severe preeclampsia cases or those admitted as a mild PIH case developed severe preeclampsia during their stay, were given Inj. MgSo4 4gm intravenous loading dose slowly over 5-10 minutes, irrespective of the anti-hypertensives received by the patient.

Time, Duration, Dose and Route of Administration of MgSo4:
As per the different randomized trials different groups adopted different regimes, dosage (loading and maintenance) and different routes (intravenous or intra muscular). In some trials MgSo4 was given when the decision on delivery was taken. Thus there is no agreement regarding the optimal time to initiate MgSo4, the dose to be used, the route of administration as well as the duration of therapy.

In few studies who gave intramuscular MgSo4, 5gm MgSo4 was given intra-muscularly in each buttock and then 4 hourly intra-muscularly.

Among the trials using intra-venous regime, the loading dose ranged from 4-6 g and the maintenance dose ranged from 1-2 g/hour. (Moodley J & Moodley VV, 1994; Coetzee E, Dommisse J & Anthony J, 1998; Belfort MA, Anthony J & Saade GR, 2003)

After giving MgSo4 loading dose, it was essential to terminate the pregnancy on the same day in 60 % of cases, in 8% of cases continuation of pregnancy was possible up to 2days, in 12% of cases pregnancy was terminated within 3-4 days, in 15% continuation of pregnancy was possible up to 1 week, in 3% of cases pregnancy could be continued up to 2-3 weeks and in 2% up to 6weeks (Figure 2).

In this study 3% patients got convulsions after a loading dose of MgSo4 (Table 1). Out of these, 1 was at 38 weeks and the rest of them were 32 weeks. 1 patient developed convulsions 6hours after Mgso4 and the other 2 had convulsions 14 hours and 26 hours respectively after administration of MgSo4. 2 were of postpartum eclampsia and 1 was antepartum eclampsia. Of the 2 postpartum eclampsia cases, 1 convulsed 8 hours after delivery and other after 14 hours (Table 2).

The trial by Coetzee et all included 822 randomized women, there were no cases of eclampsia seen when magnesium sulphate prophylaxis was used in severe preeclampsia cases.

Not a single case had any maternal or neonatal morbidity after administration of magnesium sulphate.

In the Magpie trial, there were 11 maternal deaths in the magnesium sulphate group; there was not a single death because of magnesium sulphate.

RECOMMENDATION:
All cases with severe preeclampsia must be given a prophylactic dose of magnesium sulphate of 4gm intravenously after admission under strict observation.

CONCLUSIONS:
Our study concludes that single loading dose of magnesium sulphate in severe pre-eclampsia is effective in preventing eclampsia.

The maternal, labor and perinatal outcomes were excellent.

It has a successful result of preventing eclampsia in 97% cases of my study.

This regimen requires less monitoring with no complications.

It improves patient compliance in view of no intra-muscular injections.

This regimen can be followed in PHCs and private set-ups before transferring patients to higher centers, as it is safe and effective.

In tertiary centers as well, this regimen is attractive and promising due to lesser monitoring and good maternal and perinatal outcome.

The drawback of my study is that we don't have a control group where placebo/any other anti convulsant could be given and the rate of convulsions could be compared.

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