

**STUDY OF OBSTETRIC OUTCOME AND OPTIMUM MAGNESIUM SULPHATE  
DOSING SCHEDULE IN ECLAMPSIA PATIENTS AT A TERTIARY CARE HOSPITAL**Fasiha Tasneem<sup>1\*</sup>, Bhawna Parane<sup>2</sup> and Vinutha M. Sharma<sup>3</sup><sup>1</sup>Associate Professor, Department of Obstetrics and Gynecology, GMC – Nanded, Maharashtra, India.<sup>2</sup>Resident, Department of Obstetrics and Gynecology, GMC – Nanded, Maharashtra, India.<sup>3</sup>Consultant Gynecologist, Babu Nursing Home, Chittoor, Andhra Pradesh, India.**\*Corresponding Author: Dr. Fasiha Tasneem**

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**ABSTRACT**

**Background:** Eclampsia is a common medical emergency of pregnancy mainly seen in 5% to 10% of all pregnancies. The objective of the present study was to find out the obstetric outcome of eclampsia patients and to find out the dosing schedule of magnesium Sulphate in eclampsia patients. **Methods:** All the cases of impending eclampsia and eclampsia getting admitted in tertiary care hospital are analysed prospectively for obstetric outcome and optimum magnesium sulphate dosing schedule over a study period of 18 months. **Results:** In this study of 248 patients, 114 of imminent eclampsia and 134 are of eclampsia. Incidence was higher in primigravida in the age group of 21-25 years. 62.1% delivered vaginally, 31.9% by caesarean delivery and 6% by instrumental delivery. All imminent eclampsia patients received 14 gm MgSO<sub>4</sub> and in none of them convulsions occurred. In eclampsia patients, according to standard Pritchards regime, majority (38.8%) patients received 44 gm of MgSO<sub>4</sub>. **Conclusion:** To reduce the incidence and complication of eclampsia, there is a dire need to improve antenatal care at community level. MgSO<sub>4</sub> as a drug of choice has stood the test of time for control of eclampsia and prevention of further convulsions. Even though various drugs and methods are tried, the definitive management for treatment of eclampsia is after control of convulsions and hypertension, delivery at tertiary care hospital. Termination should be individualized

**KEYWORDS:** Eclampsia, Hypertension, Convulsions, Magnesium Sulphate.**INTRODUCTION**

Hypertensive disorders in pregnancy are one of the major concerns among the obstetricians in the present day. It is a major cause of maternal and perinatal mortality and morbidity worldwide, especially in low and middle income countries where they account for 10-20% of maternal deaths. The major cause of maternal deaths in these cases is eclamptic seizures.<sup>[1]</sup>

Eclampsia is a syndrome complex peculiar to a pregnant, parturient or a puerperal woman and is characterized by tonic clonic convulsions occurring after 20 weeks of gestation in a patient with hypertension. It is multisystem disorder. Exact etiology of eclampsia is unknown.<sup>[2-5]</sup>

Though preeclampsia is not preventable, eclampsia is. In spite of the global and regional interventions and initiatives from the government, its outcome in terms of maternal and perinatal mortality continues to be worse. Eclampsia is preceded by alarming signs and symptoms of pregnancy induced hypertension.

The first principle in the management of eclampsia is the control of convulsions. MgSO<sub>4</sub> is the anticonvulsant drug of choice which prevents and controls eclamptic fits and hence reduces maternal and neonatal morbidity but its dose related toxicity is a major concern. Different MgSO<sub>4</sub> dose protocols have been used in treating eclampsia, among which Pritchard's regime is commonly used.<sup>[6]</sup> The institution of vigilant antenatal care to detect risk factors and prompt treatment of cases of pre-eclampsia will ameliorate the disease burden.<sup>[7]</sup>

So this study was conducted with the objective to study the various maternal and foetal outcome by means of morbidity and mortality in eclampsia and to analyse the effective dose of MgSO<sub>4</sub> for better fetomaternal outcome.

**METHODS**

This is a prospective observational study conducted in the department of OBG, a tertiary care centre in Maharashtra. As per universal sampling method patients falling into inclusion and exclusion criteria during study period were included in our study. In this study period of

18 months, 248 cases were reported at our institute and were included in study.

#### Inclusion criteria

All cases of eclampsia admitted in OBG casualty and all the cases of impending eclampsia requiring MgSO<sub>4</sub>.

#### Exclusion criteria

1. All routine ANC patients with known case of epilepsy, meningitis, renal disease.
2. All those who do not give consent to be enrolled into the study.
3. After obtaining permission from the Institutional Ethics Committee (IEC), all eclampsia patients admitted, those fulfilling the inclusion/exclusion criteria and those who are willing to give informed written consent were included in the study.
4. All the details about patients, their parameters and outcome was recorded in pretested case record form with prior consent of the participant.
5. Data collected was analysed by SPSS (21 version) software.

#### RESULTS

In our study of 248 patients 114 were of imminent eclampsia and 134 were of eclampsia. Majority (43.5%) of patients were from 21 to 25 years age group with mean age being 23.08 + 3.73 years. Majority (76.2%) of patients were primigravida followed by 23.8 % were multigravida. Majority (71.8%) of patients were not booked. Out of 134 eclampsia patients 82.1 % patients had antepartum eclampsia followed by 17.9 % patients with postpartum eclampsia.

Majority (72.6 %) patients were from rural areas. Majority (79%) patients were from lower socioeconomic class followed by 17.7 % patients were from middle socioeconomic class. Mean duration of hospital stay was 3.26+1.69 days. Majority (51.6%) of patients were hospitalized for 3-6 days followed by 46% patients for less than 3 days. Pre-eclampsia was the major (56.9%) risk factor followed by anaemia (41.5%) and chronic hypertension (20.6%). Majority (51.6%) patients had headache as premonitory symptom followed by nausea/vomiting (39.5%) and epigastric pain (36.3%).

**Table 1: Basic characteristics.**

Characteristics	Frequency (n=248)	Percentage (%)
<b>Age group</b>		
<20 years	86	34.7
21- 25 years	108	43.5
26-30 years	42	16.9
>30 years	12	4.8
<b>parity</b>		
Primigravida	189	76.2
Multigravida	59	23.8
<b>Booking history</b>		
Booked	70	28.2
Unbooked	178	71.8
<b>Type of eclampsia</b>		
Antepartum	110	82.1
Intrapartum	0	0
Postpartum	24	17.9
<b>Residence</b>		
Rural	180	72.6
Urban	68	27.4
<b>Socioeconomic status</b>		
Upper	8	3.2
Middle	44	17.7
Lower	196	79
<b>Duration of hospital stay</b>		
<3 days	114	46
3-6 days	128	51.6
>6 days	6	2.4
<b>Anc visits</b>		
Yes	88	35.5
No	160	64.5
<b>Risk factors</b>		
anemia	103	41.5
pre-eclampsia	141	56.9

Twins	4	1.6
chronic hypertension	51	20.6
<b>Premonitory symptoms</b>		
Headache	128	51.6
Nausea/vomiting	98	39.5
Giddiness	10	4.0
Blurring of vision	16	6.5
Epigastric pain	90	36.3

Majority (64.5%) patients had systolic BP >120 mm of Hg and 20.6% of patients had diastolic BP >110 mm of Hg. In 59.7% patients knee jerk was present and among 37.1% it was brisk. Only 18.5% of the patients had oedema present. Majority (45.2%) patients had > +1

proteinuria followed by trace proteinuria among 16.1% patients. Only 9.7% patients had abnormal funduscopy findings. Only 7.3% patients had abnormal liver function tests.

**Table no. 2: Clinical findings.**

Clinical finding	Frequency (n =248)	Percentage (%)
<b>Blood pressure</b>		
Sbp >160	160	64.5
Dbp >110	51	20.6
<b>Knee jerk</b>		
Brisk	92	37.1
Present	148	59.7
<b>Oedema</b>		
Present	46	18.5
Absent	202	81.5
<b>Proteinuria</b>		
Nil	96	38.7
Trace	40	16.1
>+1	112	45.2
<b>Fundoscopy</b>		
Normal	224	90.3
Abnormal	24	9.7
<b>Lft</b>		
Normal	230	92.7
Abnormal	18	7.3

Out of 248 patients, 114 had imminent eclampsia and 134 had eclampsia. 46% patients given loading dose and 54 % patients given loading plus maintenance dose of MgSO<sub>4</sub>, while 2.4% patients were given alternative anticonvulsant (phenytoin sodium) as these 6 patients suffered from recurrent convulsions. All patients of imminent eclampsia i.e., 114 (100%) were given loading

dose of mgso<sub>4</sub>, of which none of them had convulsions ever. Hence, loading dose could successfully prevent convulsions in imminent eclampsia patients.

Out of the 134 eclampsia patients who received the standard Pritchard's regime, 38.8 % of the patients were given 44 grams of MgSO<sub>4</sub>.

**Table no. 3: Treatment given.**

Treatment	Frequency (n =248)	Percentage (%)
MgSO <sub>4</sub> Loading dose	114	46
Mgso <sub>4</sub> loading + maintenance dose	134	54
Alternative anticonvulsant	6	2.4
<b>Total dose of mgso<sub>4</sub> in eclampsia patients (n 134)</b>		
29 gram	28	20.9

34 gram	26	19.4
39 gram	28	20.9
44 gram	52	38.8

Majority (62.1%) of the deliveries were vaginal, 31.9% had caesarean section and 6 % had instrumental delivery. Major maternal complication was PRES (4.8%), followed by DIC (3.2%), HELLP (2.4%) and abruption (2.4%). Major cause of maternal mortality was DIC

(0.8%) followed by HELLP syndrome, ARDS and ICH each 0.4 %. Prematurity (21.8%) was the major foetal complication followed by RDS (16.1%), IUGR (13.7 %) and IUFD (8.1%). 12.9 % resulted in neonatal death and 3.2 % in still birth.

**Table no. 4: Obstetric outcome.**

Parameter	Frequency (n = 248)	Percentage (%)
<b>Mode of delivery</b>		
Vaginal	154	62.1
Instrumental	15	6.0
Caesarean	79	31.9
<b>Maternal complications</b>		
Hellp	6	2.4
Arf	2	0.8
Pres	12	4.8
Dic	8	3.2
Abruption	6	2.4
Pph	2	0.8
<b>Causes of maternal mortality</b>		
Dic	2	0.8
Hellp	1	0.4
Ards	1	0.4
Ich	1	0.4
<b>Foetal complications</b>		
Prematurity	54	21.8
Iugr foetus	34	13.7
Rds	40	16.1
Iufd	20	8.1
<b>Foetal outcome</b>		
Livebirth	208	83.9
Still birth	8	3.2
Neonatal deaths	32	12.9

## DISCUSSION

Eclampsia, a multisystem disorder of pregnancy associated with raised blood pressure and proteinuria, complicates 2-8% of pregnancies. Although outcome is often good, eclampsia is a major cause of morbidity and mortality for the woman and her baby. For decades anticonvulsants drugs have been given to women with pre-eclampsia, in belief that they reduce the risk of seizures. Magnesium sulphate is now the drug of choice for women with eclampsia, with strong evidence that it is better than diazepam, phenytoin or lytic cocktail.

In this study 248 patients of impending eclampsia and eclampsia analysed with regards to their clinical signs and symptoms, correlation to age, parity, mode of delivery, management (optimum MgSO<sub>4</sub> dosing schedule), their fetomaternal outcome and various complications which occurred in patients of eclampsia.

In this study, majority (43.5%) of patients were in the age group were from 21 to 25 years with mean age was 23.08+ 3.73 which was comparable to study conducted by Ranjana et al in which mean age was 25.7+3.53 years in the Pritchard regimen group and 25.8 + 3.43 years in Dhaka regimen group.<sup>11</sup> Present study showed majority (76.2%) of cases were primigravida which is comparable to studies by Bangal et al, Pritchard et al and Sardesai et al in their studies observed 80% ,75% and 79 % of eclampsia cases in primigravidas respectively. It suggests primigravidas are predisposed to the risk of pre-eclampsia as they are exposed to chorionic villi for the first time. Majority (71.8%) of patients were not booked, it was seen that 72.6% patients were having residence at rural places. 79 % patients were from lower socioeconomic class. Sinha K et al had similar observations 74% of women had no ANC checkups, 26 % had irregular ANC visits. Most of the women belonged to lower socioeconomic status comparable to

Verma K et al where 16.92 % of eclamptic patients were from rural background.<sup>[7]</sup>

In our study 90.3% patients had antepartum eclampsia followed by 9.7 % patients with postpartum eclampsia. In the study by Sinha K et al, majority of the cases had antepartum eclampsia (77%), followed by postpartum eclampsia. Intrapartum eclampsia had the least incidence. Mean duration of hospital stay was 3.26 + 1.69. Majority (51.6%) of the patients were hospitalized for 3-6 days followed by 46% patients for less than 3days in our study.

In Dasgupta S et al study, duration of hospital stay and the number of health care staffs involved in care of the women were significantly higher in group receiving only a single loading dose of mgso4 compared to group with Pritchard regimen. In our study, pre-eclampsia was the major (56.9%) risk factor followed by anaemia (41.5%) and chronic hypertension (20.6%). In our study, 51.6% patients had headache as premonitory symptoms followed by nausea/ vomiting (39.5%), epigastric pain (36.3%) and this is greater in incidence than study by Gupte et al in which it is 22, 10 and 3% respectively.<sup>[11]</sup>

In this study 64.5% patients had systolic BP >120mmof Hg and 20.6% patients has diastolic BP >110 mm of Hg which is similar to study conducted by Verma et al reported that 50% patients had systolic BP >160 mmHg.<sup>[7]</sup> In our study, among 59.7% patients knee jerk was present and among 37.1% it was brisk, only 18.5% of the patients had oedema. 45.2% patients had more than +1 proteinuria followed by trace proteinuria among 16.1% patients. It was also observed that only 9.7% patients had abnormal funduscopy findings. In Sinha K et al study, 58% had 2+ or more proteinuria and rest had lesser grade of proteinuria with dipstick method. Dasgupta S et al study showed, there was no significant difference in between these two groups regarding clinical and laboratory parameters.

In our study, 46% patients were given loading dose and 54% patients were given loading plus maintenance dose of MgSO<sub>4</sub> while 2.4% patients given alternative anticonvulsant (Phenytoin sodium). 52 patients given 44 gm standards Pritchard regimen, but due to appearance of MgSO<sub>4</sub> toxicity we had to stop it before 44 gm in few patients. In our institute MgSO<sub>4</sub> serum levels is not measured due to lack of facility. We monitor patients for next maintenance dose by looking at parameters like urine output, respiratory rate, deep tendon jerks. Eclampsia patients were 134 to whom according to standard Pritchard's regimen MgSO<sub>4</sub> was given, of which 52 (38.8%) received 44 grams. Both the regimens ( group receiving single loading dose of mgso4 and group receiving the standard Pritchard's regime of mgso4 respectively) were equally efficacious in control (97.6% vs 97.8%, p=0.934 )and prevention of convulsions ( 96.6% vs 100% , p + 0.358). Recurrence occurred only in one case in each group, as per the study

by Dasgupta S et al several LDRs tried in several LMICs have demonstrated an efficacy of >90% in the control and prevention of eclamptic convulsions, which is comparable to that of the Pritchard's regimen. Noteworthy in the present study is that, despite subtherapeutic levels, single loading LDR could effectively control eclamptic convulsions in 97.6% cases ,demonstrating similar efficacy as that of the Pritchard's regimen (97.8%, p = 0.934) . The recurrent convulsions rate of 2.4% observed in our study is similar to few studies but remarkably lower than most other studies using single loading dose regimens.<sup>[6]</sup>

All patients of imminent eclampsia 114 (100%) were given loading dose of 14 gm MgSO<sub>4</sub>, none convulsed again. Loading dose could successfully prevent convulsions in imminent eclampsia patients.<sup>[1]</sup>

In our study, majority (62.1%) of the deliveries were vaginal, 31.9% were caesarean section and 6% were instrumental delivery. As per Ranjana et al, among patients treated with Pritchard's regime, 67.5% underwent LSCS, 25% patients delivered vaginally, while 2 had assisted natural delivery.<sup>[10]</sup> In our study major maternal complication was PRES (4.8%), followed by DIC (3.2%), HELLP (2.4%) and abruption (2.4%). Major cause of death was DIC (0.8%) followed by HELLP Syndrome, ARDS, ICH each 0.4%. In the study by Verma K et al, there were 8 maternal deaths giving case fatality rate of 6.5%. But this is much higher than reported from developed countries (0.5% to 1.8%). The most common causes of deaths were intracranial bleeding, pulmonary oedema, acute renal failure, HELLP syndrome and septicaemia. These maternal deaths were due to critical condition at arrival, delayed referral, poor transport facilities and inadequate diagnosis and treatment at peripheral centres as well as most of them did not receive any antenatal care.<sup>[7,10]</sup>

In our study, prematurity (21.8%) was the major foetal complications followed by RDS (16.1%), IUGR foetus (13.7%), IUFD (8.1%). Neonatal deaths were 12.9 % and still births 3.2%. Neonatal outcome depends on severity of associated intrauterine growth retardation, gestational age birth weight and level of facilities in NICU. Desai et al reported perinatal mortality of 33.83% with Pritchard's regimen.<sup>[12]</sup>

## CONCLUSIONS

Pre-eclampsia is a common pregnancy associated disorder. Eclampsia leads to higher maternal and perinatal mortality and morbidity, to reduce the incidence and complications of eclampsia, there is dire need to improve antenatal care at community level and increase health awareness and health education.

Mgso4 as a drug of choice has stood the test of time for control of eclampsia and prevention of further are tried the definitive management for treatment of eclampsia is

after control of convulsions and hypertension delivery at tertiary care hospital.

We conclude that Pritchard's regimen effectively controls the convulsions where MgSO<sub>4</sub> is continued till 24 hrs postpartum and it could successfully control the convulsions in those cases as well in whom we need to stop mgso<sub>4</sub> due to appearance of significant toxicity after few hours (i.e. 29 gm, 34 gm, 39 gm). High incidence of eclampsia is seen in primigravida. Hence, public awareness regarding the importance of regular antenatal visits for early detection of hypertension, pre-eclampsia can help in reducing the chances of occurrences eclampsia.

The key issue is maternal transport from rural area to tertiary level care centre. We recommend that general practitioners or medical officer at primary health centres can administer the loading dose of Mgso<sub>4</sub> i.e. 14gm prior to the transfer of the patient to a referred centre without fear. For this purpose all medical officers working at PHC should be trained in basic emergency obstetric care to be taken in a case of eclampsia.

Our study revealed that early age, low socio economic class, rural areas, less antenatal visits, unbooked patients, primigravida with other high risk factors like anaemia were more in number and these factors may play an important role in pathogenesis of eclampsia. So screening of these factors and corrections of same in pregnancy should be done which will effectively prevent risk of developing eclampsia and will improve maternal and fetal outcome.

Conflict of interest: None declared

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