

Prospective Observational Study of Magnesium Sulphate as Pritchard Regimen in Severe Pre-Eclampsia and Eclampsia

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Abstract: **Background:** Pre-eclampsia/eclampsia is a multisystem disorder of pregnancy that carries a high risk of maternal and perinatal mortality and morbidity worldwide. Magnesium sulphate is the anticonvulsant of choice in prevention and control of eclamptic convulsions. Pritchard's regimen is the most popular time-tested regimen used. Hence the present study was undertaken to study the magnesium sulphate as Pritchard regimen in severe pre-eclampsia and eclampsia. **Method:** A total of 111 pregnant women coming to labour room included in the study if their blood pressure was >140 mmHg systolic (SBP) OR >90 mmHg diastolic (DBP) on at least two occasions on at least 4 hours apart. **Results:** Out of 111 patients 17(15.32%) were antepartum eclampsia, 90(81.08%) belong to impending eclampsia and only 4(3.60%) were postpartum eclampsia. Maximum patients 66(59.46%) were primigravida, followed by multigravida 4(36.94%) and 4(3.60%) were postdelivery. The gestational age was between 27-41 weeks with mean of 35.44±3.99 weeks. Majority of patients belong to gestational age between 33-38 weeks (56; 50.45%). The mean systolic blood pressure was 161.53±16.35 mmHg and the mean diastolic blood pressure was 108±7.80 mmHg was noted on admission. Out of 111 patients 64(57.66%) was delivered by cesarean section and 47(42.34%) were delivered by vaginal route. The mean duration of stay was 10.60±4.71 days. **Conclusion:** Proper antenatal care, improved socio-economic status and intensivemanagement will largely reduce the incidence of eclampsia. Magnesium sulphate is the most preferable drug for prevention and treatment of eclamptic patients.

Keywords: Pre-eclampsia; Eclampsia; Magnesium sulphate; Anticonvulsant; Pritchard's regimen

1. Introduction

In today's obstetrics, inspite of much development in medical sciences, Hypertensive disorder is still an unsolved problem and complicate about 10 % of all pregnancies worldwide[1]. Preeclampsia is a multi-systemic disorder after the 20th week of pregnancy characterized by hypertension and development of new-onset proteinuria. Severe preeclampsia is characterised by systolic blood pressure of at least 160 mm Hg, or diastolic blood pressure of at least 110 mmHg when measured on two occasions at least 4 hours apart while the patient is on bed rest. One of the serious obstetric emergencies and complication of severe preeclampsia is eclampsia seen in our region. It is a life-threatening emergency that continues to be a major cause of maternal and perinatal morbidity and mortality worldwide. Eclampsia is defined as new onset of grand mal seizure activity and/or unexplained coma during pregnancy or postpartum in a woman with signs or symptoms of preeclampsia [2]. It is associated with few warning signs, and it is difficult to predict the occurrence of eclampsia as it can be present with mild form of the disease as well. However, the incidence of preeclampsia/eclampsia varies from one part of the world to another. Its incidence is low in the western countries, however in developing countries the incidence is still high. Therefore, excellent antenatal care and coverage to be implemented in developing countries [3].

Magnesium sulfate (MgSO₄) has long been used in obstetrics and is considered the first-line drug for treating eclampsia and severe pre-eclampsia [4, 5]. There are principally two foremost regimens for the administration of

MgSO₄. The first is the Pritchard regimen, in 1984, Pritchard published his standardized regimen which consists of the initial loading dose of 14 grams (gms) [4 gms IV + 5 gms IM on each buttock] followed by 4 hourly IM doses of 5 gms MgSO₄ for 24 hrs after the last convulsion or delivery whichever is later. Thus, a minimum total dose would be 44 gms provided no convulsion occurs after delivery. This dose will be increased if a patient is not delivered soon after the loading dose or she has further fit before or after delivery. This high dose administration not only increases the risk of toxicity but also enhances the cost of treatment, requires more vigilant monitoring, and needs adequately trained staff to monitor. These issues can become a great hurdle in the routine use of this gold standard drug [6, 7].

In recent years, several studies although on a smaller scale have been conducted especially in the low-income countries using different low dose regimens to overcome these issues [8-11]. Almost all these studies have shown promising results in terms of control of convulsions as well as maternal and fetal outcomes. In present study, we aimed to study the magnesium sulphate as Pritchard regimen in severe pre-eclampsia and eclampsia.

2. Materials and Methods

This prospective observational study was conducted in the Department of Obstetrics and Gynaecology at Tertiary care hospital during a period from January 2021 to August 2022. A total 111 pregnant women coming to labour room included in study if- Their blood pressure is >140 mmHg systolic (SBP) OR >90 mmHg diastolic (DBP) on atleast

two occasions on atleast 4 hours apart after obtaining written informed consent, have proteinuria of at least 2+ on dipstick test and patients who were willing to undergo required tests were included. Patients have hepatic coma with risk of renal failure, myasthenia gravis, associated medical disorder (anaemia, heart disease, epilepsy, asthma, thyroid disorder etc.) and patients who were unwilling to undergo required tests were excluded from the study.

A detailed history regarding age, parity, gestational age, number of convulsions, duration of symptoms of pregnancy induced Hypertension, H/o imminent symptoms were taken from close relations and also from the patient if she is conscious (or) taken retrospectively from her. Any past history of hypertension (or) renal disease (or) Eclampsia in previous pregnancy was elicited. A through general examination and obstetric examination was made. On general examination, conscious level, degree of edema, anaemia, blood pressure pulse rate, temperature, respiratory rate, cardiovascular system, Respiratory system, fundus examination was done, Blood and urine were sent for all investigations related to eclampsia like Renal functions test, Liver functions, haematological investigations were carried out in all patients. A lifeline was established, and the Regimen was started. Hourly urine output was measured by an indwelling catheter. Half hourly pulse, temperature, and respiratory rate, two hourly blood pressure was taken. Serum magnesium was measured in Department of Biochemistry. Serum magnesium sample was taken just before giving magnesium sulfate therapy and then after 30 minutes and 4 hours after giving magnesium sulfate.

Statistical Analysis

The data was analyzed statistically using the Microsoft Excel software. Descriptive statistics like mean and percentage were used to interpret data (with the help of Microsoft office 2019)

3. Observation and Results

During the study period, a total of 111 pregnant women with pre-eclampsia/eclampsia were included in the study. The maximum patients were from the age group of 21 to 25 years with mean age of patients was 23.84±3.97 years. The majority of patients had BMI between 25-30 kg/m² in 61(54.95%) wean BMI of patients was 26.57±4.14, as shown in table 1.

Table 1: Demographic profile of the patients

Demographic data	No. of patients	Percentage
Age group in years	18-20	15.32
	21-25	60.36
	26-30	17.12
	31-36	7.21
BMI (kg/m ²)	<25	33.33
	25-30	54.95
	>30	11.71

The majority of patients 90(81.08%) belong to impending eclampsia followed by antepartum eclampsia 17(15.32%) as depicted in figure 1.

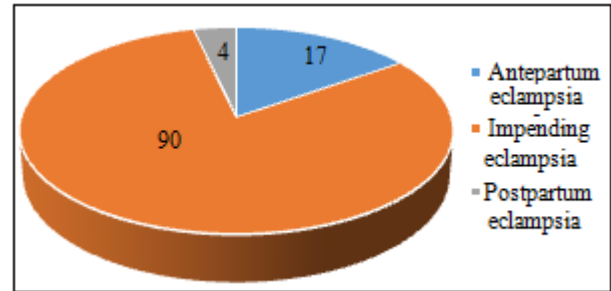


Figure 1: Distribution of patients as per type of eclampsia

Maximum patients 66(59.46%) were primigravida, followed by multigravida 4(36.94%) and 4(3.60%) were postdelivery. The gestational age was between 27-41 weeks with mean of 35.44±3.99 weeks. Majority of patients belong to gestational age between 33-38 weeks (56; 50.45%) as shown in table 2.

Table 2: Parity and gestational age

Characteristics	No. of patients	Percentage
Parity	Primi Gravida	59.46
	Multi Gravida	36.94
	Post Delivery	3.60
Gestational Age	27- 32 weeks	21.62
	33- 38 weeks	50.45
	39- 41 weeks	24.32

The mean systolic blood pressure was 161.53±16.35 mmHg and the mean diastolic blood pressure was 108±7.80 mmHg was noted on admission, (Figure 2).

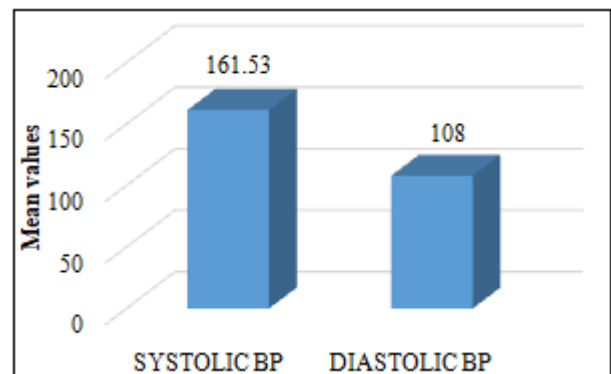


Figure 2: Distribution of patients as per systolic and diastolic blood pressure

Out of 111 patients 64(57.66%) was delivered by caesarean section and 47(42.34%) were delivered by vaginal route. In majority of patients hospital stay was between 5 -10 days with the mean duration of stay was 10.60±4.71 days as depicted in figure 3.

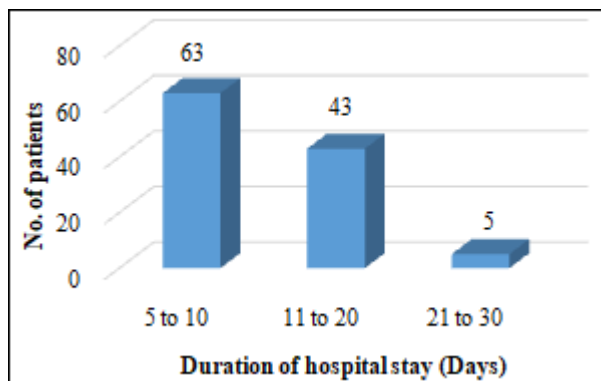


Figure 3: Distribution of patients as per duration of stay

4. Discussion

In developing countries, pre-eclampsia and eclampsia still remains a major problem inspite of medical advancement. Till now, it is one of the important causes of maternal and perinatal morbidity and mortality. This results from inadequate and suboptimal antenatal care and lack of education, awareness and transportation facilities amongst the people belonging to low socioeconomic status. There is increasing demand of extension of medical services in rural areas for the benefit of both mother and the baby [12].

In the present study, the maximum patients were distributed in the age group between 21-25 years with 67(60.36%) and 26-30 with 19(17.12%) in total. The mean age of patients was 23.84 ± 3.97 years, ranged from 18 to 36 years. In majority of patients BMI were between 25-30 kg/m² (61;54.95%) followed by <25 kg/m² in 37(33.33%) and >30 kg/m² were in 13(11.71%). Mean BMI of patients was 26.57 ± 4.14 kg/m². These findings are comparable with the previous studies [13-15].

Out of 111 patients, 17(15.32%) were antepartum eclampsia, majority of patients 90(81.08%) belong to impending eclampsia and only 4(3.60%) were postpartum eclampsia which is in accordance with the study done by Ali P et al [13] and Bhagat N et al [15]. Maximum patients 66(59.46%) was found to be primigravida, followed by 41(36.94%) was found to be multigravida and 4(3.60%) were found to be postdelivery. Similar study conducted by Sahu L et al. found that out of 25 patients 19(76%) were primigravida and 6(14%) were multigravida. They also stated that preeclampsia and eclampsia is a mainly disease of primigravida [14]. Another study conducted by Bangal V et al also found that 80% of cases were primigravida and remaining 20% were multigravida [16]. Sardesai S et al., found that majority of the patients were young primigravida with unsupervised pregnancies as is prevalent in urban and rural area. in their study out of 1050 patients 703(66.96%) were found to be primigravida and 347(37.04%) were found to be multigravida [17].

In the current study, the majority of patients belong to gestational age between 33-38 weeks in 56(50.45%) patients, followed by 39-41 weeks in 27(24.32%) and 27- 32 weeks in 24(21.62%) patients respectively. Gestational age was between 27-41 weeks with mean of 35.44 ± 3.99 weeks. Sahu L et al also observed that meant mean gestational age of patients was 34 ± 3.18 weeks in accordance with our study

[14]. Similarly, Dasgupta S et al observed that the mean gestational age of patients was 35 ± 0.78 weeks, these results were comparable to present study [18].

The mean systolic blood pressure was 161.53 ± 16.35 mmHg and the mean diastolic blood pressure was 108 ± 7.80 mmHg was noted on admission. Another study conducted by Sahu L et al. also observed that the mean systolic blood pressure was 164 ± 14.14 mmHg and the mean diastolic blood pressure was 103.4 ± 9.26 mmHg in accordance with our study [14]. Similar study conducted by Bhagat N et al. found that the mean systolic blood pressure was 159.80 ± 9.40 mmHg, and the mean diastolic blood pressure was 109.55 ± 8.80 mmHg [15]. A study conducted by Unwaha E A et al., observed that the mean systolic blood pressure was 175.3 ± 26.12 mmHg, and the mean diastolic blood pressure was 110.9 ± 15.90 mmHg [19].

Out of 111 patients 64(57.66%) was delivered by cesarean section and 47(42.34%) were delivered by vaginal route which is correlated with the previous studies [15, 19, 20]. In majority of patients hospital stay was between 5 -10 days in 63(56.76%) patients followed by 11 – 20 days in 43(38.74%) and 21-30 days in 5(4.50%) patients. With mean duration of stay 10.60 ± 4.71 days. Similar findings are reported in earlier studies [18, 19].

5. Conclusion

Adequate antenatal visits and good antenatal care will identify preeclampsia in early stages and early detection of severe features. This reduces the incidence of eclampsia or other complications in the patients of severe preeclampsia. Features of severe preeclampsia were commonly found in unbooked, high BMI patients, patients with connective tissue disorders and patients who have experienced preeclampsia in their previous pregnancies in this study. Regular blood pressure monitoring specially in predisposed individuals is essential to detect such high cases early and thus prevent complications. This can be done with the help of family physicians. Early reporting to the institute on development of severe preeclampsia, timed termination of pregnancy, wider use of magnesium sulfate, availability and implementation of emergency obstetric care facilities to mother who develop any complications of severe preeclampsia reduces the maternal morbidity and mortality. Magnesium sulphate is the most preferable drug for prevention and treatment of eclamptic patients.

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