



COMPARISON OF DHAKA AND PRITCHARD REGIMEN IN THE MANAGEMENT OF TOXAEMIA OF PREGNANCY

Obstetrics & Gynaecology

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ABSTRACT

Introduction: Toxaemia of pregnancy is one of the most common obstetrical problem in developing countries causing significant maternal and perinatal morbidity and mortality. Magnesium sulphate is the drug of choice as anticonvulsant in the management of women with eclampsia and it is also used frequently in the management of patients with features of impending eclampsia. **Objective:** To compare the effects of magnesium sulphate on fetomaternal outcome using Dhaka regimen and Pritchard regimen in the management of toxaemia of pregnancy in a tertiary care centre, Manipur. **Methods:** This prospective cohort study was conducted in the Department of Obstetrics and Gynaecology, RIMS, Imphal in 82 pregnant women with toxaemia of pregnancy admitted in from Sept 2019 to Aug 2021 years. The study subjects were divided into two groups, Group A: low dose magnesium sulphate (Dhaka regimen) and Group B: high dose magnesium sulphate (Pritchard regimen). Results were analysed using statistical package of social sciences (SPSS) 21.0. Statistical significance was set at $p \leq 0.05$. **Results:** Statistical significance was not seen in age, parity and period of gestation. Pearson chi square test for systolic and diastolic blood pressure in the two groups were $p=0.54$ and $p=0.62$ respectively. Pearson chi square test for mode of delivery was $p=0.95$ and for the maternal complications was $p=0.806$. No statistical difference in the fetal outcome was observed. **Conclusion:** The maternal morbidity and mortality in the present study were comparable in both the groups. Low-dose regimen is as effective as Pritchard regimen for controlling convulsions in eclampsia along with comparable perinatal outcome and with lower risk for magnesium sulphate toxicity. This low dose regimen may be more appropriate for use in Indian women with low body mass index and in resource poor settings where clinical monitoring is limited.

KEYWORDS

Magnesium Sulphate, Dhaka Regimen, Pritchard Regimen

INTRODUCTION

Toxaemia of pregnancy is one of the most common obstetrical problem in developing countries causing significant maternal and perinatal morbidity and mortality. The worldwide estimated eclampsia deaths per year is 50,000.¹

Magnesium sulphate is the drug of choice as anticonvulsant in the management of women with eclampsia and it is also used frequently in the management of patients with features of impending eclampsia. In 1984, Pritchard suggested that the dose of magnesium sulphate (MgSO_4) may be reduced for low body mass index (BMI) women in Asia.² Reducing the dose of magnesium sulphate without compromising its efficacy in controlling seizures and lowering mortality rates remains a major challenge.³ A study conducted by Begum et al⁴ on women with low body mass index in Dhaka explains the efficacy of low dose regimen in controlling fits. Pritchard popularized magnesium sulphate therapy in eclampsia in modern obstetrics since 1975. It was suggested that the dose of magnesium sulphate maybe reduced for low body mass index Asian women as administering Pritchard regimen might be hazardous to them.² But doubt still persists regarding suitable dose of MgSO_4 because serum magnesium level varies according to (maternal) weight.

To the best of our knowledge, studies exploring the fetomaternal outcome using the Pritchard regimen of magnesium sulphate versus the Dhaka regimen in the management of eclampsia and imminent eclampsia is limited particularly in this part of the country. Hence this present study was conducted to compare the maternal and fetal morbidity/mortality associated with the use of the two regimens of magnesium sulphate in the management of toxaemia in pregnancy.

MATERIAL AND METHODS

This prospective cohort study was carried out in the department of obstetrics and gynaecology, regional institute of medical sciences, imphal, manipur from sept, 2019 to aug, 2021 after taking approval from the institutional ethical committee, rims, imphal.

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Eighty two cases with eclampsia and imminent eclampsia (with features of severe proteinuria, generalised edema, headache, dizziness, visual disturbances and epigastric pain) admitted in the Department of Obstetrics and Gynaecology, RIMS, Imphal were included in the study. Cases of post partum eclampsia, patients who had already

received either magnesium sulphate or any other anticonvulsant treatment before admission to our hospital, other causes of convulsions like epilepsy, meningitis, encephalitis, cerebral tumours, metabolic abnormalities, cerebrovascular accidents and those who refuse to give informed written consent were excluded from the study.

The sample size was calculated based on the study conducted by Sahu L et al⁵ low-dose magnesium sulphate and standard dose regimen for management of eclampsia. Written informed consent was obtained in all the cases. All the patients included in the study were subjected to detailed history and thorough clinical examination including general physical, obstetrical and systemic examination. History was elicited from the patient and her attendants if she was brought in an unconscious state. History regarding her age, parity, booking status, gestational age, number of eclamptic fits before admission, whether she was a known case of pregnancy induced hypertension or chronic hypertension, whether she was on anti-hypertensive drugs, presence of oedema if so how long, existence of imminent symptoms like headache, vomiting, severe epigastric pain, blurring of vision all elicited thoroughly.

All the investigations including ABO and Rh type, complete hemogram including peripheral smear to see any evidence of haemolysis, liver function tests, kidney function tests, coagulation profile, Fundus examination and urine analysis for proteinuria were done. Standard profoma were filled up for each patient completely. After selecting the patients by applying inclusion and exclusion criteria they were divided in two groups assigning alternate patients in each group and magnesium sulphate was given in low dose (Dhaka Regimen) and high dose (Pritchard regimen) respectively. In Dhaka Regimen (low dose) of magnesium sulphate, a loading Dose of 4gm of 20% MgSO_4 was given intravenously slowly over 10 minutes with 3gm of 50% MgSO_4 given intramuscularly in each buttock making a full dose of 10gm. Maintenance Dose of 2.5gm 50% MgSO_4 every 4 hours intramuscularly in alternate buttocks till 24 hrs after last fit or delivery whichever was later. In Pritchard Regimen (high dose) of magnesium sulphate a loading dose of 4gm of 20% MgSO_4 was given intravenously slowly over 10 minutes with 5gm of 50% MgSO_4 given intramuscularly in each buttock making a full dose of 14gm. Maintenance Dose of 5gm 50% MgSO_4 every 4 hours intramuscularly in alternate buttocks till 24 hrs after last fit or delivery whichever was later. Parameters monitored in both regimens before next dose of MgSO_4 were Knee jerk reflex, Respiratory rate $>16/\text{min}$, Urine output $>30\text{ml/hr}$. After delivery the patient was observed carefully for

48-72 hrs in labour room and post natal ward and followed up till the discharge of the patient. Neonatal outcome was recorded in terms of gestational age, viability, Apgar score and birth weight and requirement of NICU admission. Neonates were followed up till the discharge of the mother. Pregnancy was terminated after stabilisation in all cases of impending eclampsia and eclampsia.

The primary objective of the study was to compare the efficacy of low dose regimen (Dhaka regimen) in the management of eclampsia and impending eclampsia as compared to standard Pritchard regimen. Maternal complications and perinatal outcome was taken as a secondary objective in both groups. Date of individual case was entered in MS Excel sheet and was analyzed using statistical package of social sciences (SPSS) 21.0. Statistical significance was set at $p \leq 0.05$.

RESULTS

Table 1. Distribution by Age, Parity and Period of Gestation

AGE in years	DHAKA REGIMEN N= 41	PRITCHARD REGIMEN N = 41	p- value
<20y	1	1	0.22
20y-24y	20	27	
25y-29y	14	6	
$\geq 30y$	6	7	
MEAN AGE \pm SD	25.8 \pm 4.2	25.1 \pm 4.6	0.46
PARITY			
Primigravida	26 (63.4%)	25 (61%)	0.82
Multigravida	15 (36.6%)	16 (39%)	
Period of gestation			
<32weeks	8 (19.5%)	7 (17.1%)	0.45
32- 37weeks	29 (70.7%)	26 (63.4%)	
>37 weeks	4 (9.8%)	8 (19.5%)	
MEAN period of gestation \pm SD	34.8 \pm 2.2	35.3 \pm 2.3	0.31

The mean age of the patients was 25.8 \pm 4.2 years in Dhaka group and 25.1 \pm 4.6 years in Pritchard group. Independent t-test was applied, p value came 0.46 which was found to be insignificant.

Maximum participants were primigravidas with 63.4% in Dhaka group and 61% in Pritchard group. Pearson chi square test was applied, p value came as 0.82 which was found to be insignificant.

Maximum participants were in 32-37weeks comprising 70.7% of Dhaka group and 63.4% of Pritchard group. Pearson chi square test was applied, p value came as 0.45 which was found to be insignificant. The mean period of gestation in Dhaka group was 34.8 \pm 2.2weeks and in Pritchard group was 35.3 \pm 2.3weeks. statistical significance was not observed.

Table2. Distributin by Blood Pressure

Blood Pressure in mmHg		DHAKA REGIMEN N = 41	PRITCHARD REGIMEN N = 41	p-value
SYSTOLIC BLOOD PRESSURE	<140 mmHg	1 (2.4%)	2(4.9%)	0.54
	140- 160 mmHg	7 (17.1%)	4 (9.8%)	
	>160mmHg	33 (80.5%)	35 (85.5%)	
DIASTOLIC BLOOD PRESSURE	90-100 mmHg	3 (7.3%)	3 (7.3%)	0.62
	100-110 mmHg	27 (65.9%)	23 (56.1%)	
	≥110 mmHg	11(26.8 %)	15 (36.6%)	

Maximum participants were having >160 mmHg comprising 80.5% in Dhaka group and 85.5% in Pritchard group. Pearson chi square test was applied, p value came as 0.54 which was found to be insignificant. Maximum participants were having 100-110 mmHg comprising 65.9% of DHAKA group and 56.1% of Pritchard group. Pearson chi square test was applied, p value came as 0.62 which was found to be insignificant.

Table3. Comparison Of Mode Of Delivery Between The Two Groups

MODE OF DELIVERY	DHAKA REGIMEN N= 41	PRITCHARD REGIMEN N= 41	p- value
VAGINAL DELIVERY	11 (26.8%)	5 (12.2%)	0.95
CEASAREAN SECTION	30 (73.2%)	36 (87.8%)	

Maximum participants were delivered by caesarean section comprising 73.2% of Dhaka group and 87.8% of Pritchard group. Pearson chi square test was applied, p value came as 0.95 which was found to be insignificant.

Table4. Comparison Of Maternal Complications Between The Two Groups

MATERNAL COMPLICATIONS	DHAKA REGIMEN N=41	PRITCHARD REGIMEN N=41	p- value
YES	11 (26.8%)	12 (29.3%)	0.806
NO	30 (73.2%)	29 (70.7%)	

Maximum participants had no complications comprising 73.2% of Dhaka group and 70.7% of Pritchard group. Pearson chi square test was applied, p value came as 0.806 which was found to be insignificant. Maternal complications were pulmonary edema, post partum hemorrhage, HELLP syndrome, acute renal failure and antepartum hemorrhage. One maternal death in each group was seen. Recurrence of fits after starting the regimen was lower in both the magnesium sulphate regimen groups. Only 1 patient in the Dhaka regimen group had recurrence of fits and was managed with an additional dose of 2 gm of intra venous MgSO₄. In Pritchard regimen group there was no recurrence.

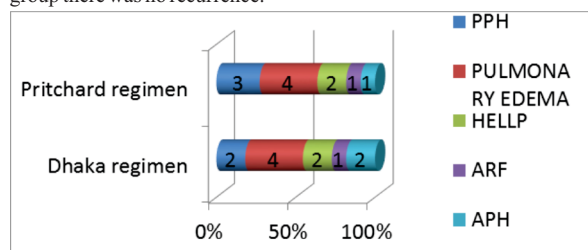


Fig1. Distribution of Maternal Complications

Table 5. Fetal Outcome (Distribution by Birth Weight, Apgar Score, NICU Admission)

FETAL OUTCOME		DHAKA REGIMEN N=41	PRITCHARD REGIMEN N=41	p- value
Birth weight in grams	<1500 g	8 (19.5%)	3 (7.3%)	0.26
	1500- 2500g	23 (56.1%)	27(65.9%)	
	≥2500g	10 (24.4%)	11 (26.8%)	
	mean±SD	2.3±0.5	2.4±0.3	0.44
APGAR SCORE	<7	12 (29.3%)	9 (22.9%)	0.44
	≥7	29 (70.7%)	32 (78.0%)	
NICU ADMISSION	YES	12(29.3%)	9(21.9%)	0.44
	NO	29(70.7%)	32(78.1%)	
NEONATAL OUTCOME	ALIVE	30 (73.2%)	33 (80.5%)	0.43
	Perinatal death	11 (26.8%)	8 (19.5%)	

Very low birth weight babies comprised of 19.5% in Dhaka group and 7.3% in Pritchard group. Low birth weight babies were maximum comprising of 56.1% in Dhaka group and 65.9% in Pritchard group. Pearson chi square test was applied, p-value came as 0.26 which was found to be insignificant.

Maximum babies had Apgar score ≥ 7 comprising 70.7% in Dhaka group and 78% in Pritchard group. Pearson chi square test was applied, p-value came as 0.44 which was found to be insignificant.

Maximum babies didn't require admission comprising 70.7% of Dhaka group and 78.1% of Pritchard group. Pearson chi square test was applied, p value came as 0.44 which was found to be insignificant.

Maximum babies were alive comprising 73.2% of Dhaka group and 80.5% of Pritchard group. Pearson chi square test was applied, p value came as 0.43 which was found to be insignificant.

DISCUSSION

Magnesium sulphate has a narrow therapeutic index leading to concerns related to its toxicity. Experience with Pritchard's magnesium sulphate regimen for eclampsia showed multiple toxicity and needed dose omission. Sardesai et al used low dose magnesium sulphate regimen in Eclampsia in Indian women and found to be very effective and safe.⁷

Studies by Sardesai et al⁷ reported that 46% of cases were below 20 years of age respectively. This high incidence in teenagers may be related to subnormal development of uterine vasculature. In the present study, 20 patients in Dhaka group and 27 patients in Pritchard Group were between 20-24 years of age, while one patient was below 20 years of age in each group

Imminent eclampsia and eclampsia are diseases of primigravida which was seen in this study 63.4% and 61% in Dhaka and Pritchard regimen group respectively. Pritchard et al², Sardesai et al⁷ and Bangal et al⁸ in their studies observed 80%, 75%, and 79% of eclampsia cases in primigravidas respectively as well. It indicates that primigravidas who are exposed to placental tissue for the first time are main victim for eclampsia and indicates the need for regular and compulsory screening of young pregnant woman especially primigravida for preeclampsia/eclampsia.

In Collaborative Eclampsia Trial Group study (1995)⁹ 39.5% cases were less than 34 weeks and 25.5% cases were presented between 34 – 36 weeks and 33% cases were presented at term. In the present study maximum patients were in 32-37 weeks of gestation 70.7% and 63.4% in Dhaka regimen group and in Pritchard regimen group respectively.

The number of convulsions occurring after the patient was started on magnesium sulphate was used as the yardstick to measure the efficacy of magnesium sulphate. Only one patient in Dhaka Group had recurrence of convulsion after the loading dose which was controlled by an additional single dose of 2 gm i.v slowly magnesium sulphate and no patient in Pritchard Group had recurrence. Pritchard and Sibai both had reported a recurrence rate of 10-12% cases. Several studies showed a recurrence rate of 4-6% with low dose magnesium sulphate therapy.^{10,5,11} The two Asian studies one by Suman P et al⁷ and another by R. Begum³ of Dhaka have concluded that the low dose magnesium sulfate therapy is as effective as standard Pritchard's regime in the Asian Group.

None of the patients with impending eclampsia in both the groups developed the seizure during entire treatment period. Sibai et al¹² reported recurrence rate of 1% out of 1158 patients who received magnesium sulphate by Pritchard regimen. Pritchard et al² reported 12.1% recurrence in 83 patients treated by magnesium sulphate. Sibai et al¹³ reported 14.2% recurrence using Pritchard regimen. In eclampsia collaborative trial recurrence rate was 5.7%. In a study by Sardesai et al, the recurrence rate was 7.89% with low dose regimen⁷. In a study by Begum et al, there was one case of recurrence out of 65 patients who received low dose magnesium sulphate³. In the present study, the perinatal mortality in Dhaka Group and Pritchard Group was 26.8% and 19.5% respectively. Sardesai et al⁷ by using low dose magnesium sulphate therapy reported a perinatal mortality of 25.87%. The high rate of perinatal mortality could be explained by factors like delays in referral, increased onset of fit to delivery interval and presence of multiple complications etc. Neonatal outcome depends on severity of associated with gestational age, birth weight and the level of facilities in neonatal intensive care unit.

REFERENCES

1. Tukur J. The use of magnesium sulphate for the treatment of severe preeclampsia and eclampsia. *Ann Afr Med* 2009;8(2):76-80.
2. Pritchard JA, Cunningham G, Pritchard SA. The Parkland Memorial Hospital Protocol for Treatment of Eclampsia. Evaluation of 245 cases. *Am J Obstet Gynecol* 1984;148:951-63.
3. Begum R, Begum A, Johanson R, Ali MN, Akhter S. A Low dose "Dhaka" magnesium sulphate regime for eclampsia. *Acta Obstet Gynecol Scand* 2001;80(11):998-1002.
4. Begum MR, Begum A, Quadir E. Loading dose versus standard regime of magnesium sulfate in the management of eclampsia: A randomized trial. *J Obstet Gynaecol*. 2002;28(3):154-9.
5. Sahu L, Singh S, Tempe A, Koner BC. A randomized comparative study between low-dose magnesium sulphate and standard dose regimen for management of eclampsia. *Int J Reprod Contracept Obstet Gynecol*. 2014;3(1):79-86.
6. Mynemba J. Magnesium sulphate for eclampsia: putting evidence into clinical practice. *Cent Afr J Med* 2000;46(6):166-9.
7. Suman S, Shivanjali M, Ajit P, Uday P. Low dose magnesium sulphate therapy for eclampsia and imminent eclampsia-Regime tailored for Indian women. *J Obstet Gynecol India*. 2003 Nov;53(6):546-50.
8. Bangal VB, Giri PA, Satyajit PG. A study to compare the efficacy of low dose magnesium sulphate regime with Pritchard regime in eclampsia. *Int J biomed adv res*. 2012;3(1):53-7.
9. The Eclampsia Trial Collaborative Group. Which anticonvulsant for women with eclampsia? Evidence from the Collaborative Eclampsia Trial. *Lancet* 1995;345: 1455-63.
10. Jana N, Dasgupta S, Das AK, Santra D, Samanta B. Experience of a low-dose magnesium sulfate regimen for the management of eclampsia over a decade. *Int J Gynaecol Obstet*. 2013;122:13-7.
11. Abdul MA, Nasir UI, Khan N, Yusuf MD. Low-dose magnesium sulphate in the control of eclamptic fits: a randomized controlled trial. *Arch Gynecol Obstet*. 2013;287(1):43-6.
12. Sibai BM. Magnesium sulfate is the ideal anticonvulsant in preeclampsia-eclampsia.

Am J Obstet and gynecol. 1990 May 1;162(5):1141-5.

13. Das M, Chaudhuri PR, Mondal BC, Mitra S, Bandyopadhyay D, Pramanik S. Assessment of serum magnesium levels and its outcome in neonates of eclamptic mothers treated with low-dose magnesium sulfate regimen. *Indian J of pharmacol*. 2015 Sep;47(5):502.