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The Management of Antepartum Eclampsia: Evaluation of the Outcome of Magnesium sulphate Regimens: Pritchard Vs Dhaka Regimens

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Abstract: ***Aim: To compare the Pritchard Regimen with Dhaka regimen of magnesium sulphate in management of Antepartum eclampsia. and to analyse the outcome of pregnancy, maternal and perinatal mortality and morbidity in both the regimens. Material and Methods: A prospective comparative study was conducted in the tertiary care centre, Government Rajaji Hospital, Madurai for a period of one year 2014-2015. 60 consecutive patients with antepartum eclampsia were included in the study. Magnesium sulphate was used in control of convulsions. 30 patients were categorized randomly under Pritchard regimen and other 30 were enrolled under Dhaka regimen. Primary outcome measured are recurrence of fits after treatment in both regimens. Perinatal mortality, maternal morbidity and mortality. Results: No difference noted in the Hypertension control, Recurrence of Seizures, Obstetric outcome, maternal morbidity and mortality and Perinatal morbidity and mortality in both the groups. Caesarean section rates among both regimens were equal indicating equal influence on the outcome of pregnancy. The maternal mortality was nil in both the groups and the perinatal mortality was 36.7% which is equivalent to that in the Collaborative Eclampsia Trial group. Conclusion: The present study provides further strong support for use of magnesium sulphate for eclampsia, there is no difference in maternal and perinatal mortality and morbidity in both the groups. The Caesarean section rates were the same in both the groups . Dhaka regimen has proved to be equally effective as Pritchard's regimen in the management of Antepartum eclampsia.***

Keywords: Antepartum Eclampsia, Pritchard Regimen, Dhaka Regimen, Status Eclampticus.

1. Introduction

Eclampsia is generalized convulsions associated with preeclampsia during pregnancy, labour or within 7 days of delivery and not caused by epilepsy or other convulsive disorders. It is one of the important causes of maternal and perinatal mortality and morbidity during pregnancy, child birth and puerperium.

Of the estimated 7, 00,000 maternal deaths every year worldwide 10% to 15% are associated with Hypertensive disorder of pregnancy.

Perinatal mortality rate in developed countries is less than 10/1000 births to as high as 80 or more/1000 births in developing countries. The Collaborative Eclampsia Trial group found that the incidence of perinatal mortality in eclampsia ranges from 224 to 307/1000 cases of Eclampsia.

Collaborative Eclampsia Trial shows-Not only does magnesium sulphate diminish the risk of further convulsions, but it also decreases maternal and perinatal morbidity and mortality than the other agents.

A smaller study carried out at Dhaka Medical College at the same time as the CET came exactly to the same conclusions. The main difference between these 2 studies was the dosage regimen of magnesium sulphate(2,3).

The loading dose of Dhaka was significantly less than that used by Collaborative Eclampsia Trial – 10 g loading dose when compared with 14 gm in tha CET. The lower dosage had been chosen because of small size of Bangladesh woman. The evidence was considered by a working party of Eclampsia in October 1997. It was agreed that the Regime validated for local use would be for National use. Guidelines were prepared and disseminated. With this regimen the mortality rates in Dhaka medical college have fallen dramatically.

This study compares the Pritchard Regimen with Dhaka regimen of magnesium sulphate in management of Antepartum eclampsia. and to analyse the outcome of pregnancy, maternal and perinatal mortality and morbidity in both the regimens, Pritchard and Dhaka on the cases of Antepartum eclampsia

2. Materials & Methods

This study was conducted in Government Rajaji Hospital, Madurai for a period of one year.2014- 2015. Of the 13668 deliveries, total number of eclampsia cases was 429. 60 consecutive patients with ante partum eclampsia were included in the study. Magnesium sulphate was used in control of convulsions. The number 30 was arbitrarily selected to allocate 10% of cases of ante partum eclampsia in each group. Every alternate patients were allocated to each regimen. 30 patients were enrolled under the Prichard regimen and other 30 were enrolled under Dhaka regimen. Comparison of parameters by percentage method and analysis was done.

History: 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.

Clinical Examination
Detailed general examination and obstetric examination were done. On general examination, conscious level, degree of edema, anaemia, blood pressure, pulse rate, temperature, respiratory rate, cardiovascular system, Respiratory system, fundus examination were done, Blood and urine were sent for all investigations related to eclampsia like Renal functions test, Liver function test, haematological investigations.

A life line was established and either of the regimen was started as for odd entry–Pritchard's regimen and for even entry-Dhaka's regimen Hourly urine output was measured by an indwelling catheter. Half hourly pulse, temperature and respiratory rate, two hourly blood pressure were taken. Serum magnesium levels measured.

3. Anti Convulsant Line Of Management

1) Dhaka Regimen of Magnesium Sulphate Regimen Loading Dose

- 4 gm of magnesium sulphate given intravenously slowly over 15 minutes.
- 3 gm given intramuscularly in each buttock.

Maintenance Dose

- 2.5 gm every 4 hours given intramuscularly in alternate buttocks, until 24hrs after administration of the first dose.
- Monitored with urine output, knee jerks and respiratory rate.

2) Pritchard Regimen of Magnesium Sulphate Regimen

4 gm of Magnesium sulphate (MgSO4 7H2O USP) as a 20% solution intravenously at a rate not to exceed 1 gm/mm. Follow promptly with 10 gm of 50% Magnesium sulphate solutions 5 gm deep IM in each buttock. 5 gm of 50% solution of magnesium sulphate every 4hours thereafter for 24 hours after delivery provided.

a) Patellar reflex is Present.
b) Respiratory Rate> 16/mm.
c) Urine output the previous 4hr exceeded 100 ml.

Anti Hypertensive Line of Management
Control of Hypertension achieved by T.Labetalol 100mg twice daily along with T. Nifedipine 10mg twice daily in cases where blood pressure is not controlled with Labetalol alone.

Obstetric Management
After stabilizing the patient, Mode of termination was planned according to the gestational age, viability of the fetus, and the cervical scoring and the associated complications if any Patients were induced with prostaglandin E gel and accelerated with Oxytocin infusion. Caesarean section was done for obstetric indications. After delivery the patient was observed carefully for 48—72 hours in the labour ward and post operative ward and followed up till the discharge of the patient. Neonatal outcome was recorded in terms of Apgar score and birth weight. Neonates also followed up till the discharger.

Outcome Measures
Primary outcome measures are recurrence of fits after starting the treatment in both the regimens. Perinatal and Maternal mortality and morbidity were compared in both groups.

4. Results and Analysis

The study was done to compare the effectiveness of 2 regimens Pritchard & Dhaka regimens. All woman with antepartum eclampsia were eligible and follow up was until discharge.

A. Characteristics of the Cases Studied
AGE, Gestational age, Parity, Level of consciousness

Age of Women in the two groups does not differ significantly. The mean age for Pritchard regimen is 22.8years and Dhaka regimen was 23.1 yrs and the P value is 0.7711 which is insignificant.

Parity in the two groups does not differ significantly.In our study 32 cases were primis. In Dhaka regimen 66.7% were primis. In CET trial group (1995)-64% were primis.. The p value being 0.07, the parity in two groups does not differ significantly.

Table 1: Gestational Age

Gestational Age	Group A (Dhaka Regimen)		Group B (Pritchard Regimen)	
	No.	%	No.	%
< 24 weeks	4	13.3	4	13.3
25 – 28	3	10	5	16.7
29 – 32	9	30	9	30
33 – 36	9	30	7	23.3
> 36	5	16.7	5	16.7
Mean	31.87		31.13	
SD	4.63		4.89	
P	0.56			

The mean gestational age of Pritchard regimen was 31.13 weeks. The mean gestational age for Dhaka Regimen was 31.87 weeks. The p value is 0.56, which is insignificant.

In a study by Katz and colleagues 2000 the mean gestational age during seizures was 34.2 weeks.

Level of consciousness of the mothers in the two groups does not differ significantly.

The conscious patients on Pritchard Regimen 11 cases (36.7%) Dhaka Regimen 9 cases (30%). The semiconscious patients in Pritchard Regimen 19 cases (63.3%) Dhaka Regimen 21 cases (70%).

The p value being 0.7842 the level of consciousness of the mothers in both groups does not differ significantly.

Table 2: Number of fits before admission

No of fits Before Admission	Group A (Dhaka Regimen)		Group B (Pritchard Regimen)	
	No.	%	No.	%
1 – 2	14	46.7	20	66.7
3 – 5	13	43.3	9	30
6 – 8	2	6.7	1	3.3
> 9	1	3.3	0	0
Mean	2.93		2.4	
SD	2.46		1.35	
P	0.5165{insignificant}			

Table 3: Recurrence of convulsions after starting the Regimen

Convulsions after Starting the Regimen	Group A (Dhaka Regimen)		Group B (Pritchard Regimen)	
	No.	%	No.	%
Nil	-	-	-	-
1	3	10	4	13.3
>1	-	-	-	-
P	0.5 (Not significant)			

In Group A 10% had one convulsion and Group B 13.3% had one convulsion and they needed a repeat dose of magnesium sulphate and the fits were controlled — none had more than one convulsion.

Table 4: Hypertension

BP	Group A (Dhaka Regimen)		Group B (Pritchard Regimen)	
	No.	%	No.	%
SBP				
120-140	3	10	3	10
140-160	15	50	17	56
> 160	12	40	10	34
DBP				
80-90	3	10	2	6.7
100-110	22	73	18	60
>110	5	17	10	33.3
P	0.7407 (Not Significant)			

- Majority of the cases have systolic blood pressure of 140-160 mm Hg-Dhaka Regimen group (50%) and in Pritchard Regimen group 56%.
- Majority of the cases have diastolic blood pressure of 100-110 mm Hg.

Mean magnesium level:

- The mean serum magnesium level of Pritchard regimen was 5.01 mg/dl .The Dhaka regimen was 4.69mg/dl.
- Both were within the therapeutic levels without going for toxicity.

Mode of induction:

- In 30 cases of Pritchard Regimen 5 cases induced with Syntocinon and 25 cases with Prostaglandin E gel.
- In 30 cases of Dhaka Regimen 7 cases were induced with Syntocinon and 23 cases with Prostaglandin B gel. The p value being 0.7469 which is insignificant.

B. Outcome in the Two Groups

Table 5: Mode of delivery

Mode of Delivery	Group A (Dhaka Regimen)		Group B (Pritchard Regimen)	
	No.	%	No.	%
Vaginal	27	90	28	93.3
LN delivery	23	76.7	24	80
Outlet forceps	3	10	3	10
Assisted Breech Delivery	1	3.3	1	3.3
Caesarean Section	3	10	2	6.7
P	0.5 (Not Significant)			

Out of 30 cases of Pritchard regimen 24 cases delivered by labour natural 3 cases by forceps 1 case as assisted breech delivery and 2 cases by LSCS. Out of 30 cases of Dhaka Regimen 23 cases delivered by labour natural 1 cases as assisted breech delivery of 3 cases by forceps and 3 cases by LSCS.

- Out of 5 cases delivered by LSCS.
- 2 were due to failed induction, 2 were fetal distress, 1 case was impending renal failure.

Table 6: Admission to delivery interval

Admission to Delivery interval	Group A (Dhaka Regimen)		Group B (Pritchard Regimen)	
	No.	%	No.	%
< 6 hours	5	17.9	7	23.3
6.1 – 12 hours	15	53.6	11	36.7
12.1 – 18 hours	8	21.4	10	33.3
> 18 hours	2	7.1	2	6.7
Mean	10.97 hours		11.81 hours	
SD	4.1		5.37	
P	0.5926			

The mean duration of Admission-Delivery interval for Pritchard Regimen was 11.8 hours and for Dhaka Regimen was 10.97 hours. In both Regimens only 2 cases in each delivered after 18 hours.
In both Regimens there is no maternal mortality and they followed up in labour ward for 48-72 hours.

Perinatal Outcome

- Born alive in Pritchard regimen 19 cases (63.3%) Dhaka Regimen 18 cases (62.1%).
- Still born in Pritchard Regime 5 cases (16.7%) In Dhaka Regimen 4 cases (13.8%).
- The neonatal death with Pritchard regimen 6 cases (20%). In Dhaka Regimen 7 cases (24.1%).

The p value being 0.7923, the effect on the perinatal mortality and morbidity doesn't differ significantly in both the regimens.

Table 8: Birth weight of Babies in the Two Groups

Birth weight	Group A (Dhaka Regimen)		Group B (Pritchard Regimen)	
	No.	%	No.	%
< 1	3	10	3	10
1 – 1.5	7	23.3	7	23.3
1.6 – 2.5	15	50	14	46.7
> 2.5	5	16.7	6	20
Mean	1.84		1.81	
SD	0.61		0.58	
P	0.801 (Not Significant)			

There is no significant difference in the birth weight of the children in the two groups.

5. Discussion

The Collaborative Trial provided vital evidence that magnesium sulphate reduces the risk of recurrent seizures compared to other standard agents like diazepam and phenytoin. Furthermore, the use of magnesium sulphate does not have detrimental effects on the neonate.

Evidence from computed tomography and magnetic resonance angiographic studies implicate cerebral vasospasm and ischemia in the genesis of eclampsia. Magnesium sulphate seems to reverse and ameliorate the effects of cerebral ischemia(11).

There may also be a moderate inhibitory effects on cortical discharge with magnesium antagonizing the excitatory glutamate N-methyl aspartate receptor(7).

Falling Serum calcium levels following administration of Intra venous Magnesium sulphate inhibit acetyl choline release at motor end plate.

In our study, we used Magnesium sulphate in both intravenous and intramuscular route as in Pritchard's and Dhaka regimen.

Diastolic Blood Pressure
In ECTG study 53% had a diastolic blood pressure above or equal to 110 mm Hg(18,19). In our study majority of cases,the Diastolic blood pressure was between 100-110 mm Hg. In Dhaka regimen 73% and in Pritchard regimen 60%. Were cases of Severe preeclampsia with AP Eclampsia

Recurrence Rate of Convulsions
The recurrence rate of convulsions after starting the regimen in Dommisse (1990) was0%, ECTG (1995) was 5.7%, PGI Chandigarh was 8.1%(41,42). In our study, Recurrence rate was 10% in Dhaka regimen and 13.3% in Pritchard regimen.

Mode of induction
Alexander and colleagues (1999) reviewed 278 singleton liveborn infants weighing 750-1500 gms delivered of woman with severe pre eclampsia in Parkiand hospital. 50% were induced and 50% underwent caesarean section without labor. Induction was not successful in 35% of women of induced group. Similar results were reported by Nassar and colleagues (1918).

In our study, in Dhaka regimen 23.2 cases induced with syntocinon and 76.7% induced with prostaglandin E gel. Among them 90% successfully delivered vaginally. 10% underwent caesarean section.

In Pritchard regimen, 16.7% induced with syntocinon and 83.3% with prostaglandin E gel. Among them 93.3% delivered vaginally and 6.7% by caesarean section. The cause for CS was failed induction and medical causes (Impending renal failure).

Perinatal Mortality
Perinatal mortality rate in Eclampsia Trial Collaborative Group (1995) with Magnesium sulphate was 25% with Diazepam 22% with Phenytoin 31%. In our study, both Dhaka and Pritchard Regimens the perinatal mortality was 36.7%., little higher than ECT group due to the fact many were (30%- 10 babies) Very low birth weight preterm infants, with less than 32 weeks gestation, hence could not be salvaged.

Maternal Mortality
The maternal mortality between 199 1-1997 approximately 6% in US were related to eclampsia. (Berg &coworkers 2003). The maternal mortality with ECTG study 1995 was 5.2%, Eclampsia Trial Collaborative group with magnesium sulphate was 3.8%. In our study both the Dhaka regimen and Pritchard regimen no maternal death occurred.

No patient developed toxicity with low dose Dhaka Regimen. The earliest sign of toxicity would be loss of tendon reflexes which usually occur when serum levels of lOmg/dl are reached.

The range of serum magnesium concentration in Dhaka Regimen was 4.69 mg%. This lies within Pritchard's therapeutic range.

In our study, 76% patients regained consciousness within 6-12 hours.

Recent evidence has suggested that in-utero exposure to magnesium may be associated with higher 1 minute Apgar score and a lower prevalence of cerebral palsy in the new born.

6. Conclusion

Magnesium sulphate is the anti convulsant drug of choice in woman with eclampsia. The low dose Dhaka Regimen used for smaller woman appears to control and prevent convulsions effectively. Our study of Dhaka Regimen showed that serum levels of Magnesium remain below the toxic levels.

The present study provides further strong support for the routine use of magnesium sulphate for eclamptic convulsions.

As long as there is adequate urinary output, clinical monitoring appears to be sufficient. There is no difference in maternal and perinatal mortality andl morbidity in both the groups. The Caesarean section rates were the same in both the groups and were done for obstetric indications.

Like the Pritchard regimen, the admission to delivery interval was lower in Dhaka regimen . The study clearly shows that Dhaka regimen is almost equivalent to Pritchard regimen, on control of convulsions on eclampsia cases.

Proper antenatal care and Screening of High risk women, Effective and Early identification and intensive management of Severe Preeclampsia, Usage of Labetalol and Nifedipine for Hypertensive control,

Watchful monitoring for Imminent symptoms, Judicious usage of MgSO4 regimens will largely reduce the incidence of eclampsia which is an important cause of maternal and perinatal mortality and morbidity.

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