ORIGINAL ARTICLE

Maternal and Perinatal Outcome of Pre-eclampsia and Eclampsia Treated With Magnesium Sulphate

Shazia Naseeb, Khadija Bano, Razia Korejo

ABSTRACT

Objective — *To determine the maternal and perinatal outcome of pre-eclampsia and eclampsia treated with magnesium sulphate.*

Study design — *Interventional study.*

Place & Duration of study — *Department of Obstetrics and Gynecology Unit-I, Jinnah Postgraduate Medical Centre Karachi, from May 2012 to April 2014.*

Methodology — *All patients admitted with pre-eclampsia and eclampsia were included. After taking detailed history and clinical examination they were treated with magnesium sulphate ($MgSO_4$). Patients were monitored for recurrent fits, side effects of $MgSO_4$, and causes of discontinuation of treatment. Maternal outcome in terms of mode of delivery, number of maternal deaths and perinatal outcome in terms of perinatal death and APGAR scores were recorded.*

Results — *The study was conducted on 50 pre-eclamptic patients (Group-I) and 100 eclamptic patients (Group II). Mean age of patient in group-I was 26.94 ±5.5 year and in Group-II 24.32±5.8 year. High frequency of eclampsia (n=61, 61%) was found in antepartum cases. Majority of patients (n=79, 52.6%) were primigravidae in both the groups. In group-II five patients had recurrence of fits. There were seven maternal deaths due to eclampsia but none of the deaths was attributed to magnesium sulphate therapy. Overall perinatal mortality was 30.7% (n=46).*

Conclusions — *Recurrence of seizure was seen in only 5% eclamptic women and none in those with severe pre-eclampsia. Magnesium sulphate was found effective in treatment as well prophylaxis of eclampsia.*

Key words — *Eclampsia, Pre-eclampsia, Anticonvulsant-$MgSO_4$, Maternal mortality.*

INTRODUCTION:

Pre-eclampsia is a pregnancy specific disorder that affects 3- 5% pregnant women worldwide and is one of the most frequently encounter medical complication of pregnancy.[1] Pre-eclampsia continues to be a major cause of maternal death.[2] Pre-eclampsia and eclampsia cause more than 60,000 maternal deaths worldwide annually.[3] According to one study prevalence of pre-eclampsia and eclampsia is around 19% in Pakistan.[4] Maternal mortality is extremely high in Pakistan where 1 in 89 women die of maternal causes with pre-eclampsia and eclampsia being major causes.[5]

There is increased risk of abruptio placentae, disseminated intravascular coagulation, acute renal failure and cerebral infarction and haemorrhage in this condition.[6] Pathophysiological processes in eclamptic seizures are still debated and there is disagreement with regards to the ideal anticonvulsant for prevention and control of seizures before introduction of magnesium sulphate. Magnesium sulphate is the drug of choice in North America. It is now in use all over the world.[7] Its mode of action is not fully known. It may cause vasodilatation and thus

Correspondence:
Dr. Shazia Naseeb
Department of Obstetrics & Gynaecology Unit I
Jinnah Postgraduate Medical Center
Karachi
E mail: snkhan1975@yahoo.com

reduce cerebral ischemia. Magnesium sulphate also affects the neuromuscular junction and increase cardiac output.[8] Magnesium sulphate significantly reduces the risk of maternal death without harmful effect to mother and foetus or newborn in short term.[4,9] Cardio-respiratory arrest is the most worrying side effect of magnesium sulphate but in collaborative trial this observation was not substantiated.[10] The present study was carried out to determine the maternal and perinatal morbidity and mortality in pre-eclampsia and eclampsia patients treated with magnesium sulphate.

METHODOLOGY:

This interventional study was done at the Department of Obstetrics and Gynaecology Unit-I, Jinnah Postgraduate Medical Center Karachi, from May 2012 to April 2014. Patients were selected through simple random sampling. All patients with severe pre-eclampsia and eclampsia whether booked or unbooked, multi or primigravidae of any age, having gestational age of 20 weeks and above were included in the study. All patients who received valium or other anticonvulsant drugs, patients with history of fits other than hypertensive disorders and those with renal and cardiac disorders were excluded.

Magnesium sulphate was given to them as an anticonvulsant. Patients were given MgSO4 according to Pritchard regime i.e. 14gm bolus (4gm I/V followed by 5mg I/M in either buttock alternatively) followed by 5mg I/M on buttock for 24 hours. Two groups were made. Group I included 50 pre-eclamptic and Group II had hundred eclamptic patients. Each group was analyzed for the effectiveness of the magnesium sulphate.

Variables noted were patient's age, gestational age, parity, type of eclampsia whether antenatal, intrapartum or postpartum etc. Side effects and complications of the treatment including seizures or their recurrence, loss of patellar reflex, urine output, respiratory depression and postpartum haemorrhage, were recorded. Details of maternal and foetal outcome in terms of mode of delivery, length of time required for hospitalization, number and causes of maternal death, number of neonatal deaths, APGAR score, admission to and length of stay in nursery or intensive care unit were also noted. Chi-Squire test was used to find out significance of results.

RESULTS:

The mean age of patients in group-I was 26.94 + 5.5 year and 24.32 + 5.87 year in group-II. The difference in age was found statistically significant (p=0.009, t=2.63). Mean gestational age of the group-I was 34.42 + 4.02 week while in group-II it was 34.4 + 5.07 week. The frequency of pre-eclampsia and eclampsia in primigravidae, was more than fifty percent (52.5%) in both the groups.

Table I: Maternal Outcome

Mode of Delivery	Pre-eclmpatic (n=50)	Eclamptic (n=100)	Total (n=150)
Vaginal delivery	30	78	108 (72%)
LSCS	12	20	32 (21.3%)
Undelivered	8	2	10 (6.6%)
Recurrent fits			
Yes	0	5	5 (3.33%)
No	50	95	145 (96.6%)
Discontinue of treatment			
Loss of patellar reflexes	4	13	17 (11.1%)
Oliguria	0	11	11 (7.3%)
Causes of maternal death			
CVA	0	4	4 (2.66%)
Pulmonary edema	0	1	1 (0.66%)
Cardiopulmonary failure due to uncontrolled Blood Pressure	0	1	1 (0.66%)
Aspiration	0	1	1 (0.66%)

Table II: Perinatal Outcome In Pre-Eclamptic and Eclamptic Groups				
Perinatal outcome	**Pre-eclampsia**	**Eclampsia**	**Total**	**p-value**
Alive	33 (66%)	61 (61%)	94 (62.6%)	0.55
Deaths:	9 (18%)	37 (37%)	46 (30.7%)	0.01
Still births	5	29	34 (22.6%)	
Early Neonatal deaths	4	8	12 (8%)	0.01
Undelivered	8	2	10 (16.6%)	0.003

Pregnancy status of the patients were categorized into three classes, antepartum, intrapartum and postpartum. Overall 61% women had antepartum, 16% intrapartum and 23% patients had postpartum elcamptic fits in group-II. Fourteen (9.3%) patients were booked in group-I and group-II. Majority of patients (n=108 - 72%) delivered vaginally. Eight pre-eclamptics (5.3%) patients were managed expectantly. Two (1.3%) eclamptic patients died undelivered (table I).

Overall recurrence of fits was observed in 5% eclamptic patients in group-II while no fit occurred in group-I. Treatment had to be discontinued in 28 (18.6%) cases in both the groups as shown in the table I. Overall seven (4.6%) maternal deaths occurred in eclamptic patients. No patient died in group-II. Cerebro vascular accidents was the cause of death in majority (n=4 - 2.66%) of the cases. Thirty-three (66%) babies born alive in group I and 61 (61%) in group II (table II). The difference in survival rate among two groups was found statistically non-significant (p = 0.55 - Chi-square = 0.36). The neonatal mortality among pre-eclamptic group was 18% and in eclamptic group 37%. The difference in mortality was found statistically significant (p = 0.01, chi-square = 5.66).

APGAR score of neonates of both groups was taken at 5 minutes was used to divide the babies into better (score >7) and poor (score <6). The percentage of better APGAR scores in the babies who delivered alive at the hospital in group-I was 83.3% and 76.3% in group-II. The difference in percentage among two groups was statistically non-significant (P = 0.40, Chi-square = 0.71).

DISCUSSION:

Pre-eclampsia and eclampsia continue to be the major cause of maternal and perinatal morbidity and mortality especially in developing countries. The marked reduction in the incidence of eclampsia over the years can be attributed to prenatal care, early detection of signs and symptoms of pre-eclampsia and prophylactic use of anticonvulsants.[11] Early antenatal registration is necessary to achieve good outcome. In the present study it was observed that 90.6% of eclampsia cases were unbooked or unregistered. Helmin stated that eclampsia will be a clinical rarity if antenatal care is made available.[12]

Anticonvulsant therapy plays an important role in the management of eclampsia. The choice of anticonvulsant remained controversial. Various drugs have been tried for this purpose.[13] The efficacy of magnesium sulphate in control of eclamptic seizure and seizure prophylaxis in pre-eclampsia is documented universally.[14] Magnesium sulphate was used in present study and results revealed that recurrence of fit was infrequent in eclampsia and no fit was observed in pre-eclampsia cases. Almost similar finding was reported by others.[15,16]

Eight (5.3%) patients were managed expectantly in pre-eclamptic group and convulsions completely prevented in these women as reported by others as well.[17] In carefully selected cases and with close supervision, pregnancy may be continued in women with eclampsia and pre-eclampsia to increase foetal growth without increasing the risk to mother as proved by a study conducted in Bangladesh.[18]

Nulliparity is a strong risk factor for pre-eclampsia and eclampsia. In our study the almost half of the patients with pre-eclampsia and eclampsia were primigravida. This was also observed by other researchers.[19] Magnesium sulphate therapy is associated with increase in duration of labour hence increase in caesarean section rate is expected. This was not observed in index study as 72% patients delivered vaginally. This finding is consistent with other studies.[20] The effect of magnesium sulphate is dose dependent and prevention of eclamptic fit occurs at a lower level as compared to myometrial inhibition.

It has been reported that there is no evidence for an association between magnesium sulphate and increased risk of neonatal death.[21] In our study

perinatal mortality rate was 30.7% and there were 12 early neonatal deaths. Majority of neonatal deaths were attributed to prematurity and congenital abnormalities. Despite declining incidence and improving care of women with eclampsia, the condition remains strongly associated with severe adverse consequences.[22] There were seven maternal deaths in eclamptic patients. CVA was the cause of death in majority of women as reported by others.[23] Most of the patients were brought late with high risk factors like increasing age, high parity, state of unconsciousness, unbooked status, multiple seizures prior to admission etc. These contributed to mortality.

CONCLUSIONS:

The mortality was high in eclampsia cases because majority of the patients were brought late in advance stage of disease. Magnesium sulphate as an anticonvulsant was effective specially in pre-eclampsia patients with no adverse effects. Recurrent fits after magnesium sulphate therapy were observed infrequently.

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