

ECLAMPSIA : BEFORE AND AFTER MAGNESIUM SULPHATE

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ABSTRACT

This study was done to see the incidence and impact of changes in the intervention strategy for the management of eclampsia in a maternity hospital on maternal and perinatal outcome.

Analysis of case records of all eclampsia cases over two different study periods designated as study period A (April, 1994 to Oct, 1996) and study period B (April, 2000 to April, 2001) were done. Total number of eclampsia cases who received intervention over two different study period (46 in study period A and 47 in study period B) were comparable despite the difference in the duration of study period. During study period A, diazepam was used as anticonvulsant, whereas magnesium sulphate was used to control fits during study period B.

Incidence of eclampsia has markedly increased in this hospital (0.12% vs 0.29%). Epidemiology and clinical profile of eclamptic patients do not show remarkable change. There was no maternal death in study period B (April, 2000 to April, 2001) whereas there was one maternal death in the study period A (April, 1994 to October, 1996). Marked improvement was noticed in terms of recurrence of fit (19.13% vs 73.91%) with change in the intervention strategy. Perinatal deaths were fewer in study period B (20% vs 33%). Overall, it seems that care of eclamptic patients and use of magnesium sulphate as anticonvulsant has resulted in positive impact on maternal outcome.

Key Words: *Eclampsia, Maternal outcome, Perinatal outcome, Intervention strategy.*

INTRODUCTION

Eclampsia is defined as the occurrence of convulsions, not caused by any coincidental neurological disease such as epilepsy, in a woman whose condition also meets the criteria for pre-eclampsia. The incidence is about 1 in 1600 pregnancies.¹ Although maternal and perinatal mortality and morbidity associated with this condition has declined, it is still one of the major cause of maternal deaths in the developing countries.

The overall maternal mortality associated with eclampsia is 2%.² Eclampsia is an important cause of maternal mortality in many parts of Africa, Asia, Latin America and the Caribbean. Hypertensive disorders contribute to approximately 9% of all maternal deaths in Nepal and almost all deaths were associated with eclampsia.³ Nepalese woman have 1 in 32 chance of dying due to pregnancy related cause and eclampsia accounts for 16% of maternal deaths.⁴ According to another study, eclampsia accounts for 13% of maternal deaths in various hospitals of Nepal.

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Eclampsia is still commonly perceived as the end of a linear spectrum that stretches from normal pregnancy, through mild hypertension, pre-eclampsia and finally eclampsia. However, eclampsia may precede pre-eclampsia and an alternative view is that seizures are one of the range of signs and symptoms caused by the widespread endothelial cell damage secondary to an ischaemic placenta.⁶ Pre-eclampsia is a multisystem disease of poorly understood etiology and the extent of involvement of various organs are unpredictable. Another important fact is that treatment of this disease is entirely empirical and symptomatic and controversy still exists in the choice of the most appropriate treatment especially for prevention and control of fits.

MATERIALS AND METHOD

This is a retrospective study of all cases of eclampsia over two different study periods with different intervention strategies. Cases admitted between April, 1994 to October, 1996 were categorized as study period A and cases admitted between April, 2000 to April, 2001 were included as study period B. Case records were reviewed and information collected and tabulated with respect to the following variables: Age, parity, antenatal care, duration of gestation, type of eclampsia, mode of delivery, perinatal outcome, maternal mortality, recurrence of fits and hospital stay.

Study period A : Diazepam and Nifedepine

1. Diazepam 10 mg intravenous (IV) bolus initially for control of fits and intermittent 10 mg i.v. bolus if there is recurrence of fits. (usually 10mg - 50mg depending upon number of recurrent fits).
2. Nifedepine sublingually/orally 60mg - 100mg in 24 hours

(maximum upto 200mg per day) to achieve the desired level of diastolic blood pressure of 90 mmHg or less and a trace of albumin or no albumin in urine.

3. Combination of pethidine 75-100mg and phenergan 25-50mg intramuscular (IM) at regular intervals for relief of pain and sedation.
4. Timely termination of pregnancy.

Study period B : Diazepam and Magnesium Sulphate

All eclamptic cases were managed in newly built maternal intensive care unit (MICU).

1. Diazepam 10mg i.v. initially to abort fit followed by intramuscular magnesium sulphate regime to prevent recurrence of fit. 4gm of magnesium sulphate given intravenously over 5-10 mins and 4gm IM in each buttock (total loading dose - 12gm) followed by maintenance dose of 4gm IM four hourly till 24 hours after delivery or last fit. In order to continue magnesium sulphate treatment, the patient should have a patellar reflex, urine flow greater than 30 ml per hour and respiratory rate of 12/min.

Diazepam drip (40mg in 5% dextrose) at 20 drops/min was given, if magnesium sulphate regime was contraindicated.

Instruction No. 2, 3 and 4 are as above in previous study period.

RESULTS

Incidence

There were 46 confirmed cases of eclampsia during the study period A out of 36,325 total deliveries, i.e. 1.2/1000 total deliveries. There were 47 confirmed cases during the study period B among 16,096 total deliveries, i.e. 2.9/1000 total deliveries.

Table I : Age distribution

Age group (years)	Study period A	Study period B
19 or less	24 [52.17%]	22 [46.80%]
20-24	15 [32.60%]	19 [40.42%]
25-29	6 [13.04%]	3 [6.38%]
30 or more	1 [2.17%]	3 [6.38%]

Eclampsia was found to be more common among young and adolescent women in both study period.

Table II : Parity distribution

Graida and parity	Study period A	Study period B
G1, P0	39 [84.78%]	38 [80.85%]
G2, P1	4 [8.69%]	1 [2.12%]
G3, P2	3 [6.52%]	6 [12.76%]
G4 or more	0	2 [4.25%]

Eclampsia was predominantly a disease of primigravidas in both study period.

Table III : Antenatal care

	Study period A	Study period B
No antenatal care	34 [73.91%]	21 [44.68%]
Antenatal care	12 [26.08%]	26 [55.31%]

Only 12 patients had some form of antenatal care during study period A [26.08%], whereas 26 patients had antenatal check up during study period B [55.31%].

Table IV : Type of eclampsia

	Study period A	Study period B
Antepartum	26 [56.52%]	33 [70.21%]
Intrapartum	13 [28.26%]	3 [6.38%]
Post partum	7 [15.21%]	11 [23.40%]

Majority of patients developed fits before delivery during both study period, but relatively more cases came as post partum eclampsia [23.40% vs. 15.21%] during study period B.

Table V : Duration of gestation at the onset of fit

	Study period A	Study period B
37-42 weeks	36 [78.26%]	34 [72.34%]
Less than 37 weeks	9 [19.50%]	13 [27.65%]
More than 42 weeks	1 [2.17%]	0

Most patients presented at term pregnancy during both study period.

Table VI : Mode of delivery

	Study period A	Study period B
Caesarean section	36 [78.26%]	26 [55.31%]
Spontaneous delivery	7 [15.21%]	12 [25.43%]
Vacuum / forceps	1 [2.17%]	3 [6.38%]
Twin delivery	1 [2.17%]	4 [8.51%]
Undelivered	1 [2.17%]	1 [2.12%]

Caesarean section was the predominant mode of delivery among eclamptic patients though relatively less caesarean delivery was performed during study period B [78.26% vs. 55.31%].

Table VII : Recurrent fits: Number of fits after intervention

Number of fits	Study period A	Study period B
none	10 [21.73%]	38 [80.85%]
1-2	10 [21.73%]	7 [14.89%]
3-4	5 [10.86%]	1 [2.12%]
5-6	5 [10.86%]	0
7-8	14 [30.43%]	1 [2.12%]
> 8	2 [4.34%]	0

36 patients continued to throw fits after intervention during study period A [75.91%], whereas only 9 patients had recurrent fits during study period B [19.13%].

Table VIII : Hospital stay

Days	Study period A	Study period B
< 10	23 [50.00%]	30 [63.82%]
10-20	21 [45.65%]	15 [31.91%]
21-30	1 [2.17%]	2 [4.25%]
> 30	1 [2.17%]	0

Majority of patients were discharged within three weeks of admission during both study period.

Table IX : Perinatal outcome

	Study period A	Study period B
Undelivered	1 [2.17%]	1 [2.12%]
Total deliveries	45	46
Total births	46	50
Total live births	39 [84.78%]	43 [86.00%]
Total stillbirths	7 [15.21%]	7 [14.00%]
Neonatal deaths	7 [15.21%]	3 [6.00%]
Pre mature deliveries	9 [22.22%]	13 [26.00%]
Low birth weight babies	14 [31.11%]	23 [46.00%]
No record of weight of babies	0	6 [12.00%]

There were 14 perinatal deaths among eclamptic patients during study period A [30.42%], whereas during study period B, there were 10 perinatal deaths [20%].

DISCUSSION

This study highlights that incidence of eclampsia has remarkably increased to approximately 3 fold, though this figure is still lower than other developing countries-2.2%,⁷ 0.93%.⁸ Increasing public awareness and easy access to the maternity hospital compared to other hospitals in Kathmandu valley may explain this increase in the incidence. At least 9 cases were referred from other health facilities of Kathmandu.

Eclampsia was found to be particularly common in adolescents and young primigravidas in both study periods. Adolescent pregnancy constitutes about 15.20% of obstetric admission in maternity hospital and may explain the higher number of cases of eclampsia in this age group. Majority of eclamptic patients had no antenatal care in both study period, though more patients had no antenatal care in study period A (73.91% vs 55.31%). This is not surprising, as in Nepal, 13% of obstetric population have antenatal care provided by doctors and 11% have antenatal care by nurses and midwives.⁴ Lack of antenatal care has been documented by several studies as risk factor for eclampsia as 93.99% patients had no antenatal care.⁹ In one study, 76.66% had no antenatal care⁷ but on the other hand, Douglas and Redman⁶ reported that eclampsia was seen despite antenatal care (70%) and within one week of women's last visit to a midwife or doctor (85%).⁶ Probably, routine screening methods during antenatal check up may not detect all potential eclamptic women and eclampsia is often unpredictable and therefore not preventable.

There was only one maternal death in study period A due to cerebro-vascular accident (case fatality rate – 2.17%). During study period B, no maternal death was recorded in hospital statistics but one patient was taken home by relatives in a state of irreversible coma. It seems that both intervention strategy were effective to prevent deaths, i.e. <5% in eclampsia. Higher maternal deaths were reported from another study (case fatality rate - 7.8%).¹⁰

Two major maternal morbidity among eclamptic women are recurrent fits and caesarean delivery. Almost all patients received intermittent bolus diazepam during study period A except one patient who received phenytoin. During study period B, all patients received magnesium sulphate regime for prevention of recurrence of fits except two patients who received diazepam infusion. Dramatic reduction was seen in recurrence of fits after intervention during study period B (19.13% vs 73.91%) compared to study period A. This indicates that previous strategy of using intermittent diazepam was not as effective as newer strategy of magnesium sulphate therapy to prevent recurrent fits.

It is understood that treatment of eclampsia is symptomatic as underlying cause is unknown. Most clinicians agree that

diazepam should be used to abort initial fit as it is effective, inexpensive, easily available and can be used by nursing staff. However, the risks include respiratory depression, respiratory arrest and aspiration pneumonia. The general aim of treatment in eclampsia is prevention of further fits as it is the recurrent fits that leads to significant cerebral anoxia and its associated adverse outcome. The greater efficacy of magnesium sulphate compared to diazepam or phenytoin for prevention of recurrence of fits is now accepted worldwide in many studies.^{11,12,13,14} The results of collaborative eclampsia trial,¹⁵ the largest multicentre randomized controlled trial, showed that in magnesium diazepam arm, there were fewer convulsions (13.2% vs 27.9%) and a non-significant lowering of maternal mortality (3.8% vs 5.1%) in women receiving magnesium sulphate regime. Other maternal morbidity were similar in both group but better perinatal outcome was seen in magnesium sulphate group. Use of magnesium sulphate is further supported by other studies.^{16,17,18}

Caesarean section was main mode of delivery during study period A (80.43%) whereas comparatively fewer caesarean section were done during study period B (55.31%). This could be partly due to more cases of post partum eclampsia at study period B were delivered at home. If fits are effectively controlled and patient is stabilized, clinician can await spontaneous vaginal delivery after inducing labour. Caesarean section clearly adds to morbidity in Nepalese women due to poor patient compliance for follow up and contraceptive use leading to complications of post caesarean pregnancy and delivery.

Perinatal deaths were 30.42% among eclamptic women during study period A, comparable to that in Patan hospital of 31.25%.¹⁹ During study period B, there was comparatively less perinatal deaths (20%) among eclamptic patients in spite of more number of premature births (26% vs 22%) and low birth weight babies (46% vs 31%). Late arrival of patients after the onset of fits results in intrauterine hypoxia and intrauterine death. Effectiveness of available neonatal care also determines the perinatal outcome.

Main limitation of a retrospective study is the incompleteness of data due to incomplete recording in cases notes. Furthermore, effectiveness of two different intervention strategy for any clinical problem is best determined by large scale prospective randomized controlled trial. However, it seems that change in the intervention strategy by managing patients in equipped intensive care unit and using magnesium sulphate regime has resulted in positive impact on overall outcome among eclamptic patients in the maternity hospital. It is recommended that multicentre prospective studies should be encouraged in this field to bring forward new information to update our existing beliefs and attitude.

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