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Research Article

Maternal and perinatal outcome in eclampsia and factors affecting the outcome: a study in North Indian population

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ABSTRACT

Background: Worldwide eclampsia is a leading cause of maternal and perinatal mortality and morbidity. Hence the importance of continued efforts in reviewing each women with eclampsia and to analyze factors affecting the outcome. Aims of the study were to evaluate maternal and fetal outcome in patients of eclampsia and factors affecting the outcome.
Methods: A retrospective epidemiological study was undertaken in the department of obstetrics and gynaecology, VMMC & Safdarjung hospital, New Delhi during the period 'January to December 2010'. Women who presented as eclampsia or developed eclampsia during hospital stay were included in the study. Data analysed included various maternal parameters and fetal parameters and the outcome of the pregnancy. Pearson Chi-square test was used to see association between two parameters.
Results: During the defined period incidence of Eclampsia was 3.2 per 1000 deliveries. Maternal death occurred in 8.4% of patients and still birth in 18.8%. Inadequate & delayed initiation of treatment and preterm deliveries was found to be associated with poor maternal and fetal outcome. As the time interval between 'onset of fit and delivery' increased, chances of adverse outcome also increased. However, age, parity, onset of seizures before, during or after delivery was not found to have any effect on maternal and fetal outcome.
Conclusions: It can be concluded that better antenatal care, early recognition of disease, timely referral, early initiation of treatment and termination of eclamptic patients improves outcome. Management of eclamptic patients should be performed at tertiary care centres, where ICU facilities, NICU facilities and multidisciplinary units are available.

Keywords: Eclampsia, Maternal-fetal outcome

INTRODUCTION

In Africa and Asia, nearly ten percent of all maternal deaths are associated with hypertensive disorders of pregnancy.[1] Among the disorders that complicate pregnancy, pre-eclampsia and eclampsia were found to be major causes of maternal and perinatal morbidity and mortality. Eclampsia was found to be third among the direct obstetric causes of maternal mortality.[1] Deaths due to eclampsia are secondary to preventable factors like cerebrovascular haemorrhage, Acute Renal Failure (ARF), coagulation failure, aspiration pneumonia, pulmonary oedema, Ante Partum Haemorrhage (APH) or Postpartum Haemorrhage (PPH).[2-4] Perinatal mortality is reported to be 5% to 11% in developed countries where as it is as high as 40% in developing countries.[3,4]

Other than early detection of preeclampsia, there are no reliable tests or symptoms for predicting the development of eclampsia. Hypertension is considered the hallmark for the diagnosis of eclampsia. But in many of the cases onset of preeclampsia is often insidious and pathological

changes start early in the course of the disease and symptoms usually occurs late. In 16% of the cases, hypertension may be absent.[5] In a series of 399 women with eclampsia, substantial Proteinuria was present in only 48% of the cases, whereas Proteinuria was absent in 14% of the cases.[5]

In developed world the incidence of eclampsia is on declining trend due to availability of health care facilities to all pregnant women.[6] Where as in developing countries universal provision of antenatal care is still lacking. Provision of timely and effective care to the women diagnosed with preeclampsia and eclampsia is important for avoiding the majority of morbidity and mortality caused by this disorder.

Hence there lies the importance of continued efforts in monitoring and reviewing the line of treatment and to analyze factors affecting the outcome.

The present study was undertaken to analyze the incidence of eclampsia, to assess the maternal and fetal outcome in patients of eclampsia and to evaluate various factors influencing this outcome, so that preventive measure could be suggested.

METHODS

Location

The study was conducted in Department of Obstetrics and Gynaecology in a tertiary hospital in New Delhi.

Duration

January 2010 to December 2010.

Study design:

Retrospective epidemiological study of pregnant women.

Patient work up

Women who presented as eclampsia or developed eclampsia during hospital stay were included in the study

Total 83 cases of eclampsia were diagnosed during the defined time period and were studied. All babies delivered of the eclamptic patients or admitted after delivery in case of postpartum eclampsia were also included in the study.

The prevalence of eclampsia in the database was obtained. Baseline maternal parameters were extracted including maternal age in years, gravidity, parity, education, socioeconomic status; duration of gestation in weeks at the time of delivery, for postpartum case gestation at delivery was taken into account.

Data were collected on ante partum and intrapartum care, BP at admission, presence or absence of proteinuria at admission by dipstick method, eclamptic episode, timing of initiation of adequate treatment, onset of fit and delivery interval, time taken to reach adequate health care facility, treatment given before referral of the patients from peripheral centers, timing of Onset of seizures in relation to delivery i.e. ante partum, intrapartum or postpartum, total number of seizures. Data was extracted from the patients file, antenatal card and referral paper.

Laboratory values included were complete blood count, serum creatinine, blood urea, serum bilirubin, serum aspartate amino transferases, alanine amino transferases and lactate dehydrogenases. Data of antenatal care included number of antenatal visits, any documented Proteinuria, and BP readings during those visits.

Antenatal care was assessed relative to WHO standards i.e. minimum four visits model.

Adequacy of referral was taken on the standards that whether any anticonvulsant was given at the time of eclamptic episode before referring the patient, whether proper medical support system accompanied the women during transit, and records of treatment given and previous records sent along with the women.

Outcome measures

Maternal outcome

Complications like APH, PPH, HELLP syndrome, ARF, pulmonary oedema, septicaemia, requirement of ventilation, Posterior Reversible Leukoencephalopathy (PRES), transient cortical blindness, brain haemorrhage and the mortality rate in patients of eclampsia.

Fetal outcome

Still birth rate, neonatal outcome, incidence of low birth weight. Still birth was defined as new-born weighing ≥500 gm at birth without any sign of life. Low birth weight is defined as birth weight less than 2500 g (up to and including 2499 g).

Statistical analysis

The mean and standard deviations were used to present continuous variables with normal distribution while median and inter quartile ranges were used in skewed data.

Categorical variables were presented as counts and percentages. Chi square test and t-test were used for comparison of categorical and continuous variables.

P value less that .05 was taken as statistically significant.

RESULTS

Sociodemographic data

A total number of 25937 women delivered during the defined time period. Out of them, 83 women were diagnosed as cases of eclampsia making an incidence of eclampsia to be 3.2 per 1000 deliveries.

Maternal outcome

There were seven maternal deaths giving a case fatality rate of 8.4%. Majority of women suffered from at least one major complication. 14.5% of women suffered from pulmonary edema. In 12% of patients ARF developed. 2.4% of women suffered from brain haemorrhage. These two women had very high BP readings on arrival and both were received in emergency in unconscious state. Brain haemorrhage was diagnosed on CT scan (Table 1).

Table 1: Maternal outcome.

Major complications	N (%)
HELLP syndrome	11 (13.2%)
ARF	10 (12%)
Pulmonary oedema	12 (14.5%)
Septicaemia	5 (6%)
DIC	2 (2.4%)
APH	4 (4.8%)
PPH	8 (9.6%)
PRES	14 (16.8%)
Required ventilation	10 (12%)
Transient cortical blindness	3 (3.6%)
Brain haemorrhage	2 (2.4%)
Death	7 (8.4%)

Fetal outcome

There were 85 fetuses, 81 singletons and two multiple pregnancies. Mean birth weight in the study group is 2.48 kgs. The incidence of still birth in the study group is 18.8%. Incidence of low birth weight is 48.2%. 18 of the fetuses were delivered before 34 weeks of gestation. There were two neonatal mortalities, both in infants with low birth weights (Table 2).

Table 2: Fetal outcome.

Variables	N (%)
Still birth	16 (18.8%)
Neonatal mortality	2 (2.35%)
Nursery admission	7 (8.2%)
Birth weight ≤2.5 kg	41 (48.2%)

Risk factors

Age and parity

15.7% of the women with eclampsia were less than 20 years of age. These young women with eclampsia were found to be at more risk of complications. Teenage mothers were more likely to suffer from septicaemia, PRES. Likewise women with age more than 30 years were also more likely to suffer from complications. 55.4% (46) of the women were primigravida. However no difference in risk was observed with the parity of the women. A primigravida was as likely to suffer from complications related to eclampsia as a multigravida.

Antenatal care

Surprisingly 56.6% of the women had received no antenatal care before the onset of convulsions. Only 43.3% of the women were seen by the doctor before the onset of convulsions. Out of the rest only 24% of women had antenatal care sufficient to the WHO standards .High BP was recorded in 4 women earlier. Proteinuria was found in 2 women. A significant observation which came out of the study was that BP and proteinuria was checked only in 12 of 36 patients even after visiting to health care facility for antenatal assessment. It was also observed that only 12 patients had premonitory symptoms. However despite these observations it was found that those 21.6% of patients who had premonitory signs and symptoms did not experience high risk of complications apart from a marginally increased risk of pulmonary oedema.

Adequacy of referral

One patient had convulsions while admitted to the hospital, the rest either came to the hospital directly after the convulsions or were referred from the peripheral centers. Out of the patients who were referred, only 7.2% of the patients were referred adequately from the peripheral centers. It was observed that patients who were not referred after giving adequate treatment were more likely to develop DIC, more patients required ventilation and increased mortality was observed these women as compared to women who were referred after being given adequate doses of $MgSO_4$, were transferred on Oxygen and were referred with proper medical support system from the peripheral centres.

Timing of convulsions in relation to labour

Out of all these case 73% presented as Ante partum eclampsia, 13.4% as postpartum and 3.6% as intrapartum eclampsia. However it was observed that timing or onset of fit was not found to be associated with increased risk of complications or poor outcome.

Investigations

For all of the women who were admitted as patients of eclampsia blood investigations were done. Serum creatinine was raised in 16.8% of patients and liver function tests were deranged in 13.2% of patients.

Gestational age

54.2% of the patient had developed eclampsia before 37 weeks of gestation. It was observed these patients were at increased risk of foetal complications like increased risk of IUGR, nursery admissions. No significant increased risk to the mother was observed in these patients.

Time taken to reach adequate health care facility

A significant finding observed was that only 12 patients (14.5%) could reach a tertiary care hospital within 6 hours of onset of convulsions. Whereas 21.7% (18) of the women could reach only after 24 hours of the onset of convulsions. Most of these women already had developed pulmonary oedema, DIC on arrival or developed later in the hospital. These patients had increased risk of mortality in comparison to patients who developed eclampsia in the hospital or reached within 6 hours (Figure 1).

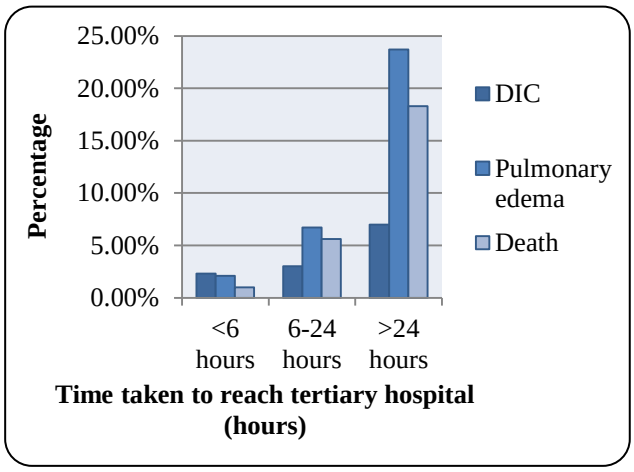

Figure 1: Figure showing association between time taken to reach tertiary care centre and pregnancy complications.

Onset of fit to delivery interval

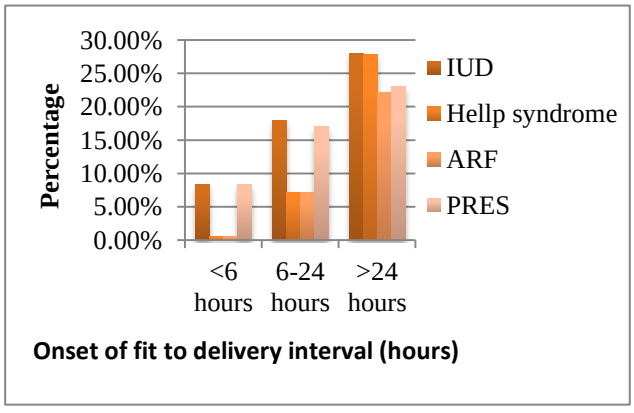

Figure 2: Figure showing association between 'onset of fit to delivery interval' and pregnancy complications.

Another significant finding of the study was that onset of fit to delivery interval also significantly affected maternal outcome. More than 24 hours of onset of fit to delivery interval was associated with more chances of IUD, PRES, Acute renal failure, DIC, HELLP syndrome (Figure 2).

DISCUSSION

This study has shown the incidence of eclampsia in North Indian population to be 3.2/1000 deliveries. This is much lower than that reported from studies from Karnataka (1.82%), Uttar Pradesh, India (2.2%), Eastern India (3.2%), Nigeria (7.8%) and Tanzania (1.37%).[7-11] The observed differences in incidence could be due to the fact that our hospital handles a major proportion of deliveries from Delhi NCR and neighboring areas apart from being a referral center for complicated cases. The incidence in developed countries is much lower due to provision of antenatal care to all pregnant women and better access to health care facilities.[6,12,13]

Morbidity and mortality observed in patients of eclampsia in our study is similar to that observed in studies from other regions of our country and other developing countries. Case fatality rate observed in our study i.e. 8.4% is similar to studies from Tanzania (7.89%) and Benin (10.7%).[4,11] It is slightly higher than that reported from Eastern India (4.4%).[9] However the case fatality rate is much higher than reported from developed countries (0.5% to 1.8%).[6,12,13] The difference in case fatality rate may be due to critical condition at arrival, more time taken to reach adequate health care facility, delayed referral, poor transport facilities for the patients and nonspecific and inadequate management given at peripheral centers. For all the 7 maternal deaths, many of the responsible factors were found which could have been avoided. Six out of seven of these patients did not seek any antenatal care; they took much long to reach adequate health care facility and 4 women suffered from recurrent convulsions during the transport. Three of these four women did not get $MgSO_4$ from the peripheral health centers.

Our study indicates that one of the major contributors to the poor outcome may be the inadequate care provided to the pregnant women. 56.6% of pregnant women did not receive any antenatal care. Moreover in the 43.3% of the pregnant women who were seen by a doctor before the onset of fit, BP and proteinuria was not checked in all. Failure to screen for preclampsia by basic modalities like BP and urine protein reflects the lack of access to basic equipments in peripheral health care centers. Other factors contributing to eclampsia related outcome is poor and often inadequate management given at the peripheral centers. Mgso4 is often not available at these centers or given in inadequate doses as indicated from the referral papers. Moreover there seems to be a failure to recognize and manage complications associated with eclampsia at peripheral centers. Many of the patients were critically ill on arrival at the critical care center.

The complications associated with eclampsia were a major predictor of morbidity and mortality associated with it. These complications contribute to the challenge of managing these eclamptic patients and improving their outcome.

The perinatal mortality in this study is found to be 21.9%. This is similar to studies from Tanzania, Benin & Eastern India.[4,9,11]

The rate of preterm infants and small for gestational age infants is higher in women with eclampsia.[14,15] This is similar to what we found in our study. The high rates of perinatal mortality could be explained by the earlier mentioned factors like delays in referral, increased onset of fit to delivery interval, presence of multiple co morbid complications. Our study indicate that majority of perinatal mortality are due to low birth weight and birth asphyxia. The significant number of low birth weight in the study is due to higher incidence of prematurity in patients of eclampsia, mostly iatrogenic.

In conclusion eclampsia complicates 1 in 312 pregnancies in a North Indian population and nearly 1 in 12 affected women die. Major contributors to the poor outcome were low percentage of antenatal attendance, inadequate antenatal care and consequently delayed presentation to the hospital, mostly with complications. Peripheral health workers should be more vigilant about early identification and treatment of women with HDP. The referring physician should stabilize the patient first and arrange for timely referral. Our best chance for improving the prognosis of these patients lie within improvement in basic health care provided to all pregnant women. Universal antenatal care should be the primary goal, so that high risk women could be recognized early before landing up into complications

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