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Original Research Article

A prospective observational study for the evaluation of maternal and fetal outcome in patient with eclampsia

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ABSTRACT

Background: Eclampsia continues to be a measure health issue in developing country. In order to get a comprehensive data on eclamptic patients we conduct a prospective observational study to address the maternal and fetal complication during pregnancy.
Methods: It is a prospective observational study conducted in a tertiary care medical college between the periods September 2016 to February 2017. During the period all patients with eclampsia admitted to the labour room were taken. Any patients with known epilepsy were excluded from the study.
Results: During the period 3780 women were admitted to the labour room, out of which 56 women had eclampsia with an incidence of 1.48%. Out this antenatal eclampsia was most common with an incidence of 91.08% followed by intra partum 4 (7.14%) and postpartum eclampsia 1 (1.78%). Majority of patients 54 (96.43%) were unbooked or inadequately supervised. Most of the patient had normalization of blood pressure after oral nifedipine 46 (82.14%), only 10 (17.86%) patient required additional injection labetalol for control of blood pressure. The maternal complications were placental abruption 8 (14.28%), HELLP 6 (10.71%), pulmonary edema 1 (1.78%), acute renal failure 1 (1.78%), DIC 1 (1.78%) and maternal death 2 (3.57%). Out of fifty six babies delivered 42 (75%) had live birth and 14 (25%) had still birth. A total of 17 (40.42%) had IUGR, 17 (40.47%) require SNCU admission post-delivery.
Conclusions: Eclampsia still remains the major cause of maternal and fetal morbidity. In low resource countries improvement in health care facility, adequate antenatal supervision, and timely referral will reduce the maternal and fetal complication.

Keywords: Eclampsia, Maternal mortality, Perinatal mortality

INTRODUCTION

Any seizure in preeclamptic women which cannot be attributed to another cause is due to eclampsia. Though mortality and morbidity due to eclampsia has been reduced dramatically in the developed world, it continues to be a major health of concern for the developing and the poorly performing country. In the western world, the reported incidence of eclampsia is 1 in 2000 but in developing countries its incidence may be as high as 100 cases per 10,000 live birth.[1] Due to the better health care facility and liberal use of prophylactic magnesium sulphate the maternal mortality rate due to eclampsia is reduced significantly. But still it continues to be second leading cause of death after thromboembolic disease in western world. The high incidence of maternal mortality in developing countries are due to the poor health care facility, inadequate antenatal care, delay in referral, multiple episodes of seizure prior to admission and lack of transport.[2] The pathogenesis of eclampsia continues to be the subject of debate and extensive research. It is not clear whether the possible changes as observed cerebral

edema with vasospasm, hypertensive encephalopathy, vasogenic edema and endothelial damage is due to the cause or due to effect of eclampsia.[3] As many a times retrospective data are misleading we conducted a prospective trial to include the eclamptic women treated in our hospital between the period of September 2016 to February 2017. The purpose of the study is to find the maternal and fetal outcome of patients with eclampsia to better understand their problem and to find ways to improve health care.

METHODS

The study was a prospective observational study conducted at VIMSAR, one of the leading medical college of Western Odisha, India. It is a tertiary care hospital with a catchment area of three large states of India. All eclamptic patients admitted to the labour room were included in the study. Patients with known neurological disorder, epilepsy were excluded from the study. Relevant patient's information was entered on a predesigned performa. Patient's information such as name, age and address were entered. Parity, gestational age at delivery, details obstetrics history, past and medical history were noted.

All patients were examined in terms of general, systemic and obstetric examination at the time of admission. Patients were investigated in terms of complete blood count, urine albumin, renal function test and liver function test. Ultrasonography of abdomen and CT scan of head were carried out whenever clinical situations demand. The information regarding the past treatment modality was also collected. All patients were treated with magnesium sulphate by Pritchard regimen. Number of patients who had recurrent seizure after initial dose of magnesium sulphate was also noted. Information on mode of delivery, maternal and fetal outcome was noted. Maternal outcomes were recorded in terms of:

- Period of gestation at admission, delivery and discharge
- Mode of delivery (vaginal delivery or caesarean section)
- Vaginal delivery (spontaneous or induced)
- Caesarean section (indications were noted)
- Maternal morbidity like abruptio placentae, acute renal failure, pulmonary edema, HELLP syndrome, disseminated intravascular coagulation and maternal death were noted.

Fetal outcome is measured in terms of

- Weight of the baby
- IUGR
- Live birth or still birth
- Apgar score
- Admission in neonatal ICU

Statistical analysis

All maternal and fetal parameters were entered in a Microsoft excel sheet and the variable were summarized using number and percentage.

RESULTS

The study was conducted prospectively in a tertiary care medical college hospital of India over a period of 6 months (September 2016 to February 2017). Total number of delivery in the same period was 3780. Out of which 56 women diagnosed to have eclampsia making an incidence of 1.48%.

Table 1: Basic characteristics of women diagnosed with eclampsia.

Maternal characteristics	N (%)
Booked	02 (3.57%)
Un-booked	54 (96.43%)
Age (mean)	22.58 years
≤25 year	50 (89.28%)
>25 year	06 (10.72%)
Parity	
Primipara	39 (69.64%)
Multipara	17 (30.36%)
BP	
>160 or >110 mm of Hg	49 (87.5%)
<160 or >110 mm of Hg	07 (12.5%)
Urine albumin	
2+	15 (26.78%)
3+ or more	41 (73.22%)
Repeat seizure	04 (7.14%)
Delivery <30 weeks	04 (7.14%)
Delivery >30 weeks	52 (92.86)
Delivery 36-40 weeks	29 (51.78%)
Eclampsia	56 (100%)
Antepartum	51 (91.07%)
Intra-partum	01 (1.78%)
Post-partum	04 (7.14%)
Received oral nifedepine only	46 (82.14%)
Oral nifedepine followed by i.v. labetolol	10 (17.86%)
Mode of delivery	
Vaginal	42 (75%)
Induced	34 (80.95%)
Spontaneous	08 (19.05%)
LSCS	14 (25%)
Failed induction	05 (35.71%)
Fetal distress	05 (35.71%)
APH	03 (21.42%)
Previous LSCS	01 (7.14%)
Mean admission to delivery interval	24hour

Most common eclampsia in present study we have found is antepartum eclampsia constituting 51 (91.07%) of total eclamptic women. Next common in the order was

postpartum eclampsia and intrapartum eclampsia with the incidence of 04 (7.14%) and 01 (1.78%) respectively. Majority of the women referred to our hospital 54 (96.43%) were unbooked with antenatal period was inadequately supervised. Two patients (3.57%) had regular antenatal check-up at our institute who later on presented with eclampsia. Most of the women 50 (89.28%) were belonging to the young age group of less than 25 years with the mean age of distribution was 22.58 years. When patients were analyzed according to parity 39 (69.64%) of primi gravida and 17 (30.36%) multigravida patients had eclampsia. Patients with systolic blood pressure of more than 160 or diastolic blood pressure of more than 110 mm of Hg were found in 49 (87.5%) of patients. All patients were found to have positive for urinary protein.

Table 2: Maternal complication.

Complications	N (%)
Placental abruption	8(14.28%)
HELLP	6 (10.71%)
Pulmonary edema	1 (1.78%)
DIC	1 (1.78%)
ARF	1 (1.78%)
Maternal death	02 (3.57%)

Out of 56 patients, 41 (73.22%) were found to have urine albumin of 3+ or more. In 52 (92.86%) patients eclampsia occurred after 30 weeks period of gestation and only 4 patients presented before 30 weeks with the sign and symptoms of eclampsia. After admission into the labour room all were given oral nifedipine tablet 10 mg for the control of hypertension. Most of the patient had normalization of blood pressure after oral Nifedipine 46 (82.14%), only 10 (17.86%) patient required additional injection labetolol for control of blood pressure. The entire patients have received injection magnesium sulphate for the treatment of eclampsia out of which 4 patients developed recurrent seizures after the initial dose of $MgSO_4$, controlled by repeat dose of $MgSO_4$. Out of 56 patients 42 (75%) delivered vaginally with 14 (25%) required caesarean section for different indications. The patient who had vaginal delivery 8 (19.05%) had spontaneous labour and 34 (80.95%) required induction of labour for eclampsia. Induction of labour was done irrespective of gestation to minimize complications. Failed induction and fetal distress was the cause for caesarean section in each of the five patients. Three patients had placental abruption and one patient had previous LSCS for which caesarean section was performed. All the clinical details of the patients described above were presented in the Table 1. The maternal complications were placental abruption 8 (14.28%), HELLP 6 (10.71%), pulmonary edema 1 (1.78%), acute renal failure 1 (1.78%) and DIC 1 (1.78%). The details of complications were summarized in Table 2. Fifty six babies delivered from the 56 women. Out of this 42 (75%) had live birth and 14 (25%) had still birth. All most 34% of women gave birth to babies whose weight was less than 1500 gram. Out of 42 live births 17 (40.47%) required nursery care to prevent complications arising from prematurity and low birth weight. Details of it are tabulated in Table 3.

Table 3: Fetal outcome.

Fetal characteristics	N (%)
Live born	42 (75%)
Still born	14 (25%)
<1500 gram	06/19 (31.57%)
>1500 gram	08/37 (21.62%)
IUGR	17 (30.35%)
<1500 gram	19 (33.92%)
>1500 gram	37 (66.08%)
SNCU admission	17/42 (40.47%)

We have compared the maternal parameters who have given a live born or still born baby is summarized in Table 4. The incidence of placental abruption between the pregnant women giving rise to live born and still born babies were 2 (4.76 %) and 6 (42.85%) respectively. It showed that placental abruption was the main cause behind such intra partum death. Also there is increasing incidence of HELLP 3/14 (21.42%) and 3/42 (7.14%) in Still born and live born group respectively. There was also 1 patient who developed acute renal failure and 1 had DIC (disseminated intravascular coagulation) who gave birth to a still born baby. Two (3.57%) patients died because of the complication of eclampsia. One pregnant woman died because of the complication HELLP, she was referred to us at 34 weeks. Another woman was referred at 31 weeks died because of acute renal failure.

Table 4: Comparison of maternal outcome in still born and live born baby.

Still born N (%)	Live born N (%)
Total - 14 (25%)	42 (75%)
Placental abruption- 06 (42.85%)	02 (4.76%)
HELLP- 03 (21.42%)	03 (7.14%)
DIC-01 (7.14%)	00 (0%)
Pulmonary edema- 00 (0%)	01 (2.38%)
ARF- 01 (7.14%)	00 (0%)

DISCUSSION

This prospective observational study was carried out to analyse the maternal and fetal parameter of patient with eclampsia. Though the incidence of patients with eclampsia is decreased in developing countries it is far from reality in India and other developing countries. Incidence of eclampsia is between 1-2% in most of the studies published in developing countries.[2-4] We have also similar incidence of 1.48%. One of the reason of why there is rising incidence of eclampsia in poorly performing countries is due to most of the patient never had either antenatal check-up or inadequate supervision

during pregnancy. This leads to failure to detect preeclampsia on time. In our study too, we have 96.43% of patients were inadequately supervised pregnancy giving rise to high incidence of eclampsia. Similarly, high incidence of eclampsia also reported from the studies conducted in other parts of world.[2,5] It is proposed that, first time or superabundance exposure to chorionic villi is one of the aetiological factor for the development preeclampsia, that is why majority of study found primi gravida women is at risk for the development of eclampsia.[6,7] We have found 69.64% of women were primi gravida. Majority of patients (89.28%) had age less than 25 years. Similar results were observed among other studies too.[2,5,8] Eclampsia is primarily characterised as seizure, increase blood pressure and proteinuria in a preeclamptic women. We have found proteinuria, in all patient presented with eclampsia, though atypical eclampsia can present without overt proteinuria. Most of them reported a blood pressure of ≥160/110 mm of Hg. We have found 87.5% of our patient had either systolic blood pressure of >160 or diastolic blood pressure of >110 mm of Hg. This gives the importance of keeping the fact in mind as blood pressure record of <160/110 and without overt proteinuria are not immune to develop eclampsia. After the MAGPIE trial there is a universal use of prophylactic $MgSO_4$ in severe preeclampsia.[9] But despite this still antepartum eclampsia is the most commonly seen in the clinical practice. It is due to failure to recognize the severe preeclamptic women who were more at risk to develop eclampsia and also failure to give prophylactic $MgSO_4$ to all of them. We have found 91.07% of patient presented with ante partum eclampsia. This high result is due to delayed referral to tertiary care health center. This result consistent with the finding of other studies.[2,10] Eclampsia is mainly a disease of third trimester of pregnancy. Many studies published earlier showed around 45% of eclamptic women presented between 36 to 40 weeks of gestation.[1,5]

The present study shows 51.78% of patients had presented between 36 to 40 weeks of gestation. Because of poorer access to health facility, improper referral of the patient to higher centre the maternal and perinatal mortality is still high in developing countries. To deal with the hypertensive crisis oral Nifedipine, i.v. labetolol or i.v. hydralazine is most commonly used. Studies compared hydralazine with the labetolol and nifedipine with the labetolol found all three are equally effective in controlling hypertension.[11,12] But the cost of nifedipine is $1/25^{th}$ and $1/40^{th}$ times that of labetolol and hydralazine. So nifedipine can be a good alternative in low resource country like India over the other drugs. The main stay of treatment for eclampsia is delivery of the mother along with supportive treatment for the control of malignant hypertension and control of seizure. Due to this most of the patient either requires induction of labour or caesarean section. In our study 75% of patient delivered vaginally out of which 80.95% patient required induction of labour. Many studies in the literature reported increased incidence of caesarean section in patient with eclampsia.[1,2,6,7] We have 25% of patient required caesarean section for delivery. Vaginal delivery always preferable over caesarean section, as immediate relief will not occur by delivering the mother by any route but serious complications are less likely in patient delivered vaginally.[13] One of the cause of increase incidence of caesarean section is due to avoid prolonged labour, increased incidence of fetal distress and placental abruption. We have induction to delivery interval is 24 hours in 75% of patient suggesting that vaginal delivery can be tried without prolonging the duration of labour. It is always being tried and should be preferred over caesarean section. As many women when come to the tertiary care center are in a poor general condition. These women should be started on induction after initial stabilization of the mother. We have 30.35% of patient had some form of complication arising due to eclampsia, with similar result obtained in various other studies.[1,5,14] Most common complication is placental abruption (14.28%), HELLP (10.21%), pulmonary edema (1.78%), DIC (1.78%), acute renal failure (1.78%). Studies conducted at UK, Netherland, Dublin showed either no mortality or mortality rate of <0.1% though for this country mortality rate of this order is more than thousand-fold.[15,16,17] Recent studies conducted in developing countries shows mortality rate of 5% though studies conducted in Nigeria reported mortality rate up to as high as 18.3%.[6,18] In present study we reported a high mortality rate of 3.57%. The major cause of fetal morbidity is due to high incidence of preterm labour (58.92%), IUGR (30.35%). Such high rate of preterm labour and IUGR is due to early delivery of mothers to prevent complication which may arise due to eclampsia. So its incidence will difficult to change with the improvement of health care facility. In the present study 25% of mother had a still birth. Other studies reported incidence of still birth between 12%-16%.[3,5] This high incidence of still birth is due to delayed referral and poor antenatal care, which can be improved with the better antenatal check-up and strengthening of the infrastructure.

CONCLUSION

In low and middle income countries eclampsia is one of the leading cause of maternal and perinatal mortality. It is due to the fact that eclampsia involves almost each and every organ of the body. Maternal and fetal outcome can be improved by better provision of health care facility, antenatal care and improvement of socioeconomic conditions. Patient with severe preeclampsia and eclampsia should be treated with $MgSO_4$. Pregnant women after stabilization early induction of labour with preference to vaginal delivery over caesarean section should be preferred.

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