International Journal of Reproduction, Contraception, Obstetrics and Gynecology
Jain R et al. Int J Reprod Contracept Obstet Gynecol. 2017 Jul;6(7):2806-2811
www.ijrcog.org

pISSN 2320-1770 | eISSN 2320-1789

DOI: http://dx.doi.org/10.18203/2320-1770.ijrcog20172557

Original Research Article

Maternal and perinatal outcomes in eclampsia: a retrospective analysis in a referral hospital

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Received: 18 May 2017
Accepted: 24 May 2017

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ABSTRACT

Background: Eclampsia is defined as the development of convulsions and / or unexplained coma during pregnancy or postpartum in patients with signs and symptoms of preeclampsia. The objective of present study was to investigate the incidence of eclampsia, the clinical profile, maternal and perinatal outcomes in eclamptic patients in our hospital setting.
Methods: The retrospective analysis of case records of all eclampsia cases was done over a period of one year, in department of Obstetrics and Gynaecology, Gajra Raja Medical College, Gwalior, Madhya Pradesh, India.
Results: The incidence of eclampsia was13.04/1000 deliveries. Eclampsia was more common in the age group 20-24 years (55.64%), primigravidae (62.90%) and patients from rural areas (76.61%). Majority (91%) of women were referred from different hospitals. 112 (90.32%) patients were unbooked. 74 (59.67%) patients developed eclampsia during antenatal period before onset of labor. 67.01% patients presented at gestational age > 37 weeks. Lower segment caesarean section was the predominant mode of delivery in 66 (68.04%) patients. 11.29% patients required ventilatory support and pulmonary edema developed in 4.83% of cases. Maternal death occurred in 7.25% of cases.with a case fatality rate of 16.07%. Pulmonary edema was the commonest cause of death. 7 (5.6%) patients presented with intrauterine death on admission. There were 5 (4.06%) perinatal deaths reported in present study.
Conclusions: Eclampsia is still a common and serious complication of pregnancy. Proper antenatal care, detection of preeclampsia with early management and timely referral of high - risk patients, administration of $MgSO_4$ in correct doses and properly timed caesarean section in selected cases would reduce the incidence of eclampsia associated maternal and perinatal morbidity and mortality in our facility.

Keywords: Eclampsia, Perinatal death, Pulmonary edema

INTRODUCTION

Eclampsia is defined as the development of convulsions and / or unexplained coma during pregnancy or postpartum in patients with signs and symptoms of preeclampsia. Preeclampsia and eclampsia occur much more commonly in first - time pregnancies and appear typically with minimal or no warning. Unfortunately, preeclampsia is not preventable, nor is its onset accurately predictable.[1]

Eclampsia occurs antepartum in 38-53%, intrapartum in 15-20%, and postpartum in 11-44% of the cases. The diagnosis of eclampsia is usually clear when women present with seizures, hypertension and proteinuria. In approximaterly 15% of the cases hypertension and proteinurea are not present. However, when seizures develop in a pregnant woman without a history of seizure disorder, eclampsia should be the diagnosis until proven otherwise.[2]

WHO estimates the incidence of preeclampsia to be seven times higher in developing countries (2.8% of live births) than in developed countries (0.4%). A preeclamptic woman in a developing country is three times more likely to progress to eclampsia than a woman in a developed country. WHO estimates that eclampsia develops in 2.3% of preeclamptic women in the developing world, compared with 0.8% of preeclampsia cases in developed countries.[1]

Eclampsia is associated with elevated maternal and fetal morbidity and mortality. The World Health Organisation (WHO) estimates that at least 16% of maternal deaths in developing countries result from preeclampsia and eclampsia.[1] Approximately 63,000 pregnant women die every year because of these conditions. Preeclampsia/eclampsia ranks second only to haemorrhage as a specific, direct cause of death.[1] The most common causes of maternal death are intracranial bleeding and acute renal failure secondary to abruption placentae. Perinatal mortality occurs in 5-12% of the cases. The most common causes of fetal death are prematurity and fetal asphyxia.[2]

A retrospective study of eclampsia cases was carried out to evaluate the incidence of eclampsia, demographic characteristics, clinical profile and maternal and perinatal morbidity/mortality associated with it in our hospital setting. This study aims to assist in planning interventions that will reduce the incidence, morbidity and mortality associated with eclampsia.

METHODS

This is a retrospective study of 124 cases of eclampsia, admitted in Department of Obstetrics and Gynaecology, Gajra Raja Medical College, Gwalior, Madhya Pradesh during a period of 1 year from January 2015 to December 2016. All women with antepartum, intrapartum or postpartum eclampsia who were admitted with history of convulsions or developed after admission, during study period were included in the study.

Exclusion criteria

- Women who were known case of epilepsy.
- Seizures due to metabolic disturbances, space occupying lesions or intra cerebral infections.

The case records of all eclamptic women were reviewed. Parameters collected and analysed with regard to maternal age, parity, booking status, gestational age, number of convulsions, treatment received before presentation, blood pressure and laboratory test parameters. Mode of delivery, maternal and perinatal outcomes were also studied.

All the cases of eclampsia were managed with $MgSO_4$ as an anticonvulsant. We followed the Pritchard's regime of 4 gms I.V and 10 gms I/M at the time of admission and 5 gms I/M fourth hrly after checking urine output, knee jerks and respiratory rate. For recurrent convulsions phenytoin or lorazepam were used in different cases. Injection labetalol as I.V. bolus / infusion was used to control severe hypertension. After stabilization of patients pregnancy was terminated irrespective of the gestational age. The cause of death was determined from the clinical diagnosis. Postmortem examination was not done in any case.

Analysis was done with the excel computer software and results were reported as percentage.

RESULTS

During the study period, total number of deliveries recorded was 9502. Eclampsia developed in 124 women, with an incidence of 13.04 / 1000 deliveries.

Table 1: Demographic characteristics.

Characteristic	Number	Percent
Maternal age in years		
<19	6	4.83
20-24	69	55.64
25-29	39	31.45
30-35	9	7.25
>35	1	0.80
Parity		
Primigravidae	78	62.90
Multigravidae	46	37.09
Locality		
Rural	95	76.61
Urban	29	23.38
Referral status		
Direct	33	26.61
Referred	91	73.38
Booking status		
Booked	12	9.67
Unbooked	112	90.32

Table 1 demonstrates demographic characteristics of patients. Eclampsia was more common in the age group 20-24 years (55.64%), primigravidae (62.90 %) and patients from rural areas (76.61%). Majority (91%) of women were referred from different hospitals. 112 (90.32%) patients had no antenatal visits.

Table 2: Type of eclampsia.

Type of eclampsia	No. of cases	Percent
Antepartum	74	59.67
Intrapartum	23	18.54
Postpartum	27	21.77
Total	124	100.0

The timing of fits was antepartum in 74 (59.67%), intrapartum in 23 (18.54%) and postpartum in 27 (21.77%) patients (Table 2).

Table 3: Gestational age at the onset of fit.

Gestational age in weeks	No. of cases	Percent
<28	5	5.15
28-32	8	8.24
33-36	19	19.58
> 37	65	67.01
Total	97	100.0

Majority of patients 65 (67.01%) presented at gestational age > 37 weeks, 19 (19.58%) patients between 33-36 weeks, 8 (8.24%) patients between 28-32 weeks and 5 (5.15%) at <28 weeks (Table 3).

Table 4: Blood pressure at presentation.

Blood pressure in mm Hg	No. of cases	Percent
≥160/110	77	62.09
140/90-1 59/109	38	30.64
<140/90	9	7.25
Total	124	100.0

62.09 % patients presented with severe hypertension with blood pressure >160/110, 30.64% patients had blood pressure between 140/90 – 159/109 and 7.25% patients had blood pressure < 140/90 (Table 4).

Table 5: Number of convulsions before start of anticonvulsant therapy.

No. of convulsions	No. of cases	Percent
1	29	23.38
1-4	57	45.96
>4	38	30.64
Total	124	100.0

Majority of patients 57 (45.96%) had 1-4 convulsions, 38 (30.64%) patients had >4 and 29(23.38%) patients had 1 convulsion before start of anticonvulsant (Table 5).

Table 6: Mode of delivery.

Mode of delivery	No. of cases	Percent
Vaginal delivery	30	30.92
Lower segment caesarean section	66	68.04
Undelivered	1	1.03
Total	97	100.0

66 (68.04%) patients were delivered by lower segment caesarean section, while 30 (30.92%) patients delivered vaginally. 1 patient died undelivered (Table 6).

The most common indication of caesarean section was unfavourable cervix in 54 (81.81%) patients (Table 7).

11.29% patients required ventilator y support. Pulmonary edema developed in 4.83% of cases. Maternal death occurred in 7.25% of cases. Of the 56 maternal deaths for the period, eclampsia contributed to 9 deaths, with a case fatality rate of 16.07% (Table 8).

Table 7: Indication of caesarean section in eclamptic patient.

Indication	No. of cases	Percent
Unfavourable cervix	54	81.81
Non-progress of labor	5	7.57
Fetal distress	3	4.54
Others	4	6.06
Total	66	100.0

Table 8: Maternal morbidity and mortality due to eclampsia.

Maternal complication	No. of cases	Percent
Required ventilation	14	11.29
Pulmonary edema	6	4.83
HELLP syndrome	4	3.22
Acute renal failure	2	1.6
Abruptio placentae	4	3.22
Shock	2	1.6
Disseminated intravascular coagulation	4	3.22
Post-partum haemorrhage	4	3.22
ARDS	4	3.22
Retinal edema	4	3.22
Prolonged coma	4	3.22
Maternal death	9	7.25

Pulmonary edema was the commonest cause of death in 6 cases. In 2 cases cause of death was acute renal failure and 1 patient died due to Cerebrovascular accident (Table 9).

Table 9: Causes of maternal death in eclampsia.

Cause	Number	Percent
Pulmonary edema	6	66.66
Acute renal failure	2	22.22
Cerebrovascular accident	1	11.11
Total	9	100.0

Table 10: Fetal outcome.

Fetal outcome	No. of cases	Percent
Alive	111	89.51
Intrauterine death	7	5.6
Still Birth	1	0.84
Neonatal death	4	3.22
Undelivered	1	0.84
Total	124	100.0

111 (89.51%) babies were born alive, 7 (5.6%) patients presented with intrauterine fetal death on admission. There were 5 (4.06%) perinatal deaths (1 stillbirth and 4 neonatal deaths) reported in present study (Table 10).

Table 11: Birth weight.

Birth weight in Kg	No. of cases	Percent
< 1.5	15	12.09
1.5 - 2.4	44	35.48
> 2.5	65	52.41
Total	124	100.0

65 (52.41%) patients delivered babies with birth weight > 2.5 kg, 44 (35.48 %) babies had birth weight between 1.5-2.4 kg and 15 (12.09%) babies were < 1.5 kg (Table 11).

DISCUSSION

The incidence of eclampsia in our study was 13.04/1000 deliveries, which is similar to the incidence reported by Sasmita Swain et al and G. Mahalaxmi et al, lower than the incidence reported by Aparna khan et al (3.54%) and Adamu AN et al (4.4% in Nigeria) and higher than that reported in a study in Qatar, a developed country (.31/1000 deliveries).[3-7] Incidence of hypertensive disorders in India is found to be 10.08% as observed through the data collected by National Eclampsia Registery (NER) (11,266 out of 1,11,725 deliveries) over the past 3 years with 2,554 patients out of this presenting with eclampsia.[8] This variation seen in the incidence is due to difference in socioeconomic factors, available obstetric care, financial and geographic barriers and cultural practices.

Eclampsia was more common in the age group 20 - 24 years (55.64%), similar finding was reported in the studies by G. Mahalaxmi et al and Aparna Khan et al [4,5]. As per NER data 76.34% of the patients were between 21 and 30 years of age.[8]

Gravidity also influences the incidence of eclampsia. In present study majority 78 (62.90 %) of patients were primigravidae. Sasmita Swain et al and Prabhakar gawandi et al also reported similar finding in their studies.[3,9]

In present study, 95 (76.61%) patients were from rural areas and majority (91%) of women were referred from different hospitals. Many of the maternal complications seen in the eclamptic patients appeared to arise from delays in the management of preeclampic patients. Training of medical officers and paramedical staff posted in primary health centers, to handle an eclamptic patient is mandatory to improve maternal and fetal outcome.

Majority (90.32%) of patients had no antenatal visits. Lack of antenatal care is one of the important risk factors for the development of eclampsia. In a study by Pannu D in North India 56.6% of women had received no antenatal care before the onset of convulsions.[10] This indicates the importance of antenatal care as the single intervention which could influence the occurrence of this serious complication. In unbooked cases the signs and symptoms of preeclampsia remain unrecognized until severe complications such as eclampsia occur.

Majority of patients 74 (59.67%) developed eclampsia during antenatal period before onset of labor, while 21.77% developed eclampsia after delivery. Similar observation was reported in studies by Runjun Doley et al and Hema Kanta Sharma et al, where antepartum eclampsia was the commonest type.[11,12]

The majority of post-partum eclampsia had their first fit within 2 to 48 hours after birth, 26 patients had fit after vaginal delivery while only 1 patient following caesarean section. It follows that women with mild hypertension during pregnancy may have blood pressures above their autoregulatory threshold putting them at risk during the puerperium, where blood pressure monitoring is decreased, yet with no clinical profile to differentiate them from low risk women.[13] This changing pattern of eclampsia confronts health professionals with the challenge of recognizing women in the puerperium with neurologic symptoms that need prompt referral.[13]

When gestational age at the onset of convulsions was taken into account, then it was found that majority of patients (67.01%) presented at gestational age of > 37 weeks. Sunita T.H. et al and Runjun Doley et al, also reported similar finding in their study.[11,14]

62.09 % patients presented with blood pressure >160/110 mmHg. In a study by Sunita T.H.et al, 68% of eclamptic women had severe hypertension.[14] In present study 30.64% patients had blood pressure between 140/90 – 159/109 mm Hg and 7.25% patients had blood pressure < 140/90 mm Hg. It had been suggested that eclamptic women without significant hypertension had even lower nonpregnant blood pressure, resulting in a lower limit of the cerebral autoregulatory curve. In addition, circulating factors capable of initiating blood – brain barrier disruption may be involved, increasing the susceptibility to eclampsia.[13]

Majority of patients (45.96%) had 1-4 convulsions and 30.64% patients had >4 convulsions before start of anticonvulsant. As per NER data, 40.55% mothers had 1-4 convulsions before admission. Greater number of convulsions prior to care may be due to lack of reachable facilities. Time spent in access to care is crucial and may alter maternal and fetal outcome.[8]

96 % of referred patients received injection MgSO4 in referral facilities before referral to our institute. The positive research data from the Magpie trial led institutions including the WHO and the American College of Obstetricians and Gynaecologist (ACOG) to recommend the use of magnesium sulfate as the first-line treatment for preeclampsia and eclampsia.[1]

The definitive treatment of eclampsia is delivery, irrespective of gestational age. If fits are effectively

controlled and patient is stabilized, clinician can await spontaneous vaginal delivery after inducing labor. In present study 68.04% patients were delivered by lower segment caesarean section while 30.92% patients delivered vaginally. 1 patient died undelivered. Sunita TH et al, Sharara HA, Doley R et al and Ajah OA et al, also reported caesarean section as predominant mode of delivery as in present study.[7,11,13,15] The decision for delivery by caesarean section was taken after considering the maternal clinical condition, status of fits, fetal status, cervical Bishop score, likelihood of success of induction of labor and stage of labor.

In 81.81% patients, indication of caesarean section was unfavourable cervix. Induction of labor in these patients with unfavourable cervix, resulting in delay in delivery may adversely affect maternal and fetal outcome, so long inductions should be avoided as was observed in present study.[2] Concerns about delay of delivery include disease progression to multiorgan disease, maternal central nervous system and placental abruption.

In present study main, maternal complications were pulmonary edema, ARDS, DIC, abruption placentae, and postpartum haemorrhage. Critical care management has been advised for pregnancies complicated by eclampsia. Mechanical ventilatory support (required in 14 patients) and advanced monitoring in intensive care unit (ICU) were the major interventions in this study. Out of 14 patients who were kept on ventilatory support, 4 patients died and one patient developed prolonged coma. Current intervention strategy of managing eclampsia and care of patients in equipped intensive care unit in our hospital is effective in reducing maternal morbidity and mortality.

There were total 9 cases of maternal death due to eclampsia in the study period, accounting for a case fatality rate of 16.07%. The most common cause of death was pulmonary edema. Other causes were acute renal failure and cerebrovascular accident. The women who developed pulmonary edema in the course of treatment had poor outcome. Pulmonary oedema is a common complication of severe preeclampsia and eclampsia, affecting approximately 3% of these patients.[2] Most cases are the results of aggressive use of crystalloid solutions for intravascular volume expansion. So, it is important to restrict fluid administration in patients with preeclampsia and eclampsia.

The maternal mortality rate of 7.25% due to eclampsia, reported in this study was lower than that reported by Khan A et al (29.76%), Adamu AN et al (29.4%) and Pannu D et al (8.4%).[5,6,10]

In present study, there were 5 perinatal deaths among eclamptic patients and 7 patients were admitted with intrauterine fetal demise, out of which 6 delivered vaginally, 1 was delivered by caesarean section while one remains undelivered as patient died. 5 babies were admitted to neonatal ICU for very low birth weight, out of which 4 could not survive. Prematurity and low birth weight were the main causes of perinatal mortality. Late arrival of patients after onset of fits results in severe intrauterine hypoxia and intrauterine death. Available neonatal care facilities also determine the perinatal outcome. Swain S et al and Mahalaxmi G et al, reported higher perinatal deaths in their studies.[3,4]

Patients presented to our hospital were already in critical stage because of delays in seeking health care by the patients themselves or by not recognizing the signs of imminent eclampsia. Further the delay in transport of patients after onset of fits from remote areas is another factor responsible for adverse maternal and perinatal outcome as seen in our study.

CONCLUSION

Eclampsia is still a common and serious complication of pregnancy. Proper antenatal care, detection of preeclampsia with early management and timely referral of high – risk patients, administration of magnesium sulfate in correct doses and properly timed caesarean section in selected cases would reduce the incidence of eclampsia associated maternal and perinatal morbidity and mortality in our facility. While there is no cure for eclampsia, treatment measures can prevent and reduce maternal and perinatal morbidity and mortality. Still many cases of eclampsia appear not to be preventable even among women receiving regular antenatal care, which can be due to the abrupt onset and late post-partum onset.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

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Cite this article as: Jain R, Bindal J. Maternal and perinatal outcomes in eclampsia: a retrospective analysis in a referral hospital. Int J Reprod Contracept Obstet Gynecol 2017;6:2806-11.