

Perinatal and Maternal outcomes of Eclampsia in Darbhanga District, Bihar, India

Madhu Sinha¹, Sanjay Kumar Sinha²

ABSTRACT

Introduction: Pre-eclampsia is characterized by new-onset hypertension and proteinuria at ≥ 20 weeks of gestation. In India, the perinatal mortality of neonates of eclamptic mothers is also very high to the extent of about 30–50%, in spite of all efforts of Government to bring down maternal and perinatal mortality. Study aimed to evaluate the maternal and perinatal outcome of eclampsia in a hospital of Darbhanga, Bihar, India.

Material and methods: Retrospective analysis of 298 proven cases of eclampsia (hypertension, albuminuria, convulsion/coma) admitted to the Hospital Darbhanga, Bihar from November 2015 to September 2017 was done and findings were presented in tables and graphs.

Results: In the study period of 2 years, there were 87 maternal deaths. Eclampsia accounted for 22 maternal deaths, 3 died undelivered and 19 after delivery, accounting a case fatality rate of 8.3% due to eclampsia.

Conclusion: Eclampsia is associated with significant maternal and perinatal morbidity and mortality. The higher death is due to high percentage of the patient being unbooked; majority receive no therapeutic intervention until admission

Keywords: Perinatal and Maternal outcomes, Eclampsia

INTRODUCTION

Pre-eclampsia is characterized by new-onset hypertension and proteinuria at ≥ 20 weeks of gestation. Pre-eclampsia can progress to eclampsia, which is characterized by new-onset grand mal seizures and affects 2.7–8.2 women per 10,000 deliveries.^{1,2} Complications of pre-eclampsia or eclampsia include cerebrovascular accidents, liver rupture, pulmonary oedema or acute renal failure that can result in maternal death.³ Adverse perinatal outcomes of pre-eclampsia and eclampsia are mainly attributed to preterm delivery, which occurs secondary to maternal or fetal complications, intrauterine growth restriction (IUGR) and fetal death.⁴

In India, the incidence of eclampsia range from 1 in 500 to 1 in 30 (0.5%–1.8%)²⁻³. The occurrence, however, depends on the availability, accessibility and quality of antenatal care. Consequently, rates are higher where healthcare provision is constrained for a variety of reasons.⁴

Maternal mortality in eclampsia is intolerably high in India, and ranges from 2%–30%, much more in the established rural hospital than in urban equivalent. In India, the perinatal mortality of neonates of eclamptic mothers is also very high to the extent of about 30–50%,⁵ in spite of all efforts of Government to bring down maternal and perinatal mortality. The present study was undertaken with the intention to evaluate the maternal and perinatal outcome of eclampsia in a Darbhanga Medical College & Hospital, Bihar, India.

MATERIAL AND METHODS

This study was carried out in 298 patients all proven cases of eclampsia (hypertension, albuminuria, convulsion/coma) admitted to the Darbhanga Medical College & Hospital, Bihar from November 2015 to September 2017. Before commencement of the study, the aim and objectives of the study were explained in detail to the district Chief Medical Officer, and ethical clearance was obtained for the same. All information regarding demographic profile, antenatal care, clinical finding, laboratory findings were noted. Seizures were controlled by using Magnesium Sulfate as per the Pritchard regimen. Delivery of the patient was the definitive treatment. The outcome of both, the mother and her newborn was traced till discharge or death.

STATISTICAL ANALYSIS

The collected data was processed through Microsoft Excel and tabulated in the form of tables and graphs.

RESULTS

Out of 7012 admitted obstetrics patients, 298 presented with eclampsia during the one year study period. This yielded an incidence of 4.24%. Most of the eclamptic patient (55.3%) were below 21 years of age, 88.7% were referred, and 11.3% came directly. Majority (97.4%) patients have not received quality antenatal care. 94% of these patients did not have their blood pressure, urine protein checked during their prenatal period.(Figure-1)

The highest risk of eclampsia is among the patient with first pregnancy 67.3%. Eclampsia occurred mostly (63.9%) in 28–30 weeks of gestation followed by 20.7% in pregnancies beyond 37 weeks. 15.4% patients had eclampsia before 28 weeks of gestation.

Among those who developed eclampsia, 88.3% were antepartum, 6% were intrapartum, and 5.6% were postpartum. 76.4% Patients delivered vaginally. The reasons for C- section were CPD (cephalopelvic disproportion), failed induction and malpresentation. 71.4% cases delivered within 24 hours of onset of convulsions.(Table-1)

Senior Resident Department of Obstetrics And Gynaecology, Darbhanga Medical College & Hospital, Darbhanga, ²Professor and Head of Department, Department of Anatomy, Katihar Medical College, Katihar, Bihar, India

Corresponding author: Sanjay Kumar Sinha, Professor and Head of Department, Department of Anatomy, Katihar Medical College, Katihar, Bihar, India

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| Time of onset and no. of seizures | | Frequency | Percent |
|----------------------------------------------------------|----------------------------------------|-----------|---------|
| Occurrence of convulsion | Antepartum | 235 | 88.3 |
| | Intrapartum | 16 | 6.0 |
| | Postpartum | 15 | 5.6 |
| No. of Convulsions | <3 | 108 | 40.6 |
| | 3-6 | 107 | 40.2 |
| | >6 | 51 | 19.2 |
| MgSO ₄ Received before coming to the hospital | Given | 222 | 83.5 |
| | Not given | 44 | 16.5 |
| Delivery (Mode and Interval) | | | |
| Convulsion Delivery Interval | < 6 Hrs | 48 | 18 |
| | 6-24 hrs | 190 | 71.4 |
| | >24 hrs | 10 | 3.8 |
| Mode of Delivery | Vaginal | 201 | 76.4 |
| | LSCS (lower segment Caesarean section) | 62 | 23.3 |
| | Died Undelivered | 3 | 1.1 |

Table-1: Time of Onset and No. of Seizures

| Maternal complications and outcome | No. of Patients Live (%) | Died (%) |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|------------|
| Acute renal failure | 3 (1.2%) | 10 (45%) |
| Pulmonary oedema | 12 (4.9%) | 17 (77.2%) |
| Antepartum haemorrhage (APH) | 07 (2.8%) | 01 (4.5%) |
| Postpartum haemorrhage (PPH) | 13 (5.3%) | 00 |
| Required ventilation | 61 (25%) | 22 (100%) |
| Septicaemia | 04 (1.6%) | 06 (27.2%) |
| HELLP syndrome/DIC | 07 (2.8%) | 04 (18%) |
| Cerebrovascular accident | 00 | 02 (9.09%) |
| Aspiration pneumonitis | 00 | 01 (4.5%) |
| Multi organ failure | 00 | 08 (36%) |
| Results: | | |
| PRES | 01(0.4%) | 00 |
| Peripartum Cardiomyopathy | 01 (0.4%) | 00 |
| Ventilator associated pneumonia | 00 | 01 (4.5%) |
| Pulmonary embolism | 00 | 01 (4.5%) |
| Metabolic encephalopathy | 00 | 01 (4.5%) |
| Uremic encephalopathy | 00 | 01 (4.5%) |
| Severe anaemia | 00 | 01 (4.5%) |
| Death | 00 | 22 (100%) |
| Discharge | 244 (100%) | 00 |
| HELLP Syndrome - Hemolysis, elevated liver and low platelets counts syndrome; DIC - Disseminated intravascular coagulation; PRES - Posterior reversible encephalopathy syndrome | | |

Table-2: Maternal complications and outcome

Maternal outcome: In the study period of 2 years, there were 87 maternal deaths. Eclampsia accounted for 22 maternal deaths, 3 died undelivered and 19 after delivery, accounting a case fatality rate of 8.3% due to eclampsia. Maternal mortality due to eclampsia was 25.2%. Many patients had more than one complication at the same time. Causes of death included pulmonary edema, acute renal failure, multiple organ failures. HELLP developed in 11 patients, of which 4 died (18%), and 7 survived. Pulmonary edema developed in 29 patients, 17 died (77.2%), and 12 survived. 13 patients had an acute renal failure, 10 died (45%). 4 patients were taken up for dialysis following which 3 survived. 10 patients had septicemia, and 6 (27.2%) succumbed to it. 1 case suffered had PRES, and 2 had a cerebral vascular accident

| Fetal complications and outcome | No. of Patients Died (%) | Live (%) |
|---------------------------------|--------------------------|------------|
| IUD | 56 (53.8%) | 00 |
| Still birth | 20 (19.2%) | 00 |
| Nursery admission | 28 (26.9%) | 96 (60%) |
| Intrauterine growth retardation | 06 (5.7%) | 15 (9.4%) |
| Preterm baby | 18 (17.3%) | 22 (13.8%) |
| Low birth weight | 40 (38%) | 50 (31.4%) |
| Neonatal death | 28 (26.9%) | 00 |
| Health baby | 00 | 63 (39.6%) |

Table-3: Fetal complication and outcome

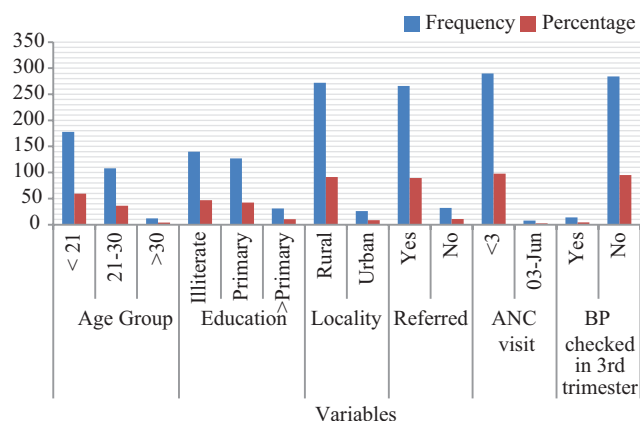


Figure-1: Demographic characteristics

as the cause of death. 83 patients required ventilation. Out of which, 61 (25%) survived, and all 22 cases which died were on a ventilator. The most common reason for ventilation was pulmonary edema. 49 cases were kept on ventilation due to reasons like tachypnea, laboured breathing, difficulty in maintaining oxygen saturation. 3 (1.2%) patients recovered from acute renal failure after dialysis. 7 cases (2.8%) which survived had APH. PPH developed in 13 (5.3%) cases. 2.8% cases recovered from HELLP syndrome. There was one case of cardiomyopathy. (Table-2)

Perinatal mortality: Out of 298 cases, (3 died undelivered) 104 fetus died. Perinatal mortality rate was 39.5% Intrauterine death were 56 (53.8%). Stillbirth accounted for

19.2% of perinatal mortality and 26.9% of neonatal death. 124 newborn got admitted in the nursery, of which 28 (26.9%) died, 96 (60%) were live. There were 28 (26.9%) neonatal deaths. 63 (39.6%) babies were shifted to mother side after observation. Reasons for admission were preterm (21.1%), Intrauterine growth restriction (IUGR) (15.1%), low birth weight (69.4%), meconium aspiration, low Apgar score. Most common causes of perinatal death were birth asphyxia, prematurity, meconium aspiration and neonatal sepsis. (Table 3)

DISCUSSION

The incidence of eclampsia varies from country to country. In general eclampsia is preventable and it is less common in developed countries(UK, USA). In our study, the incidence of eclampsia was found to be 3.82% of hospital deliveries. The high incidence in our study is due to huge burden of referrals to Darbhanga mainly from nearby underprivileged areas, where the antenatal facilities are still poor. Deepika Pannu et al, 2014 reported the incidence of eclampsia as 3.2% of all hospital deliveries.⁶

Eclampsia was more frequently noticed in pregnant women of less than 30 yrs age (93.5%) and primigravidas (67.3%) which is similar to a study done by Sunita TH et al, 2013⁷ (85% and 79%). Majority of patients (97.4%) of eclampsia in our hospital were not booked with us. In her study found that majority of eclamptic cases there was lack of antenatal care. In our study 88.31% of eclampsia were antepartum, 6% were intrapartum and 5.6% were postpartum. In Abdullah et al. (2010)⁸ study antepartum eclampsia was seen in 21 (47%) cases followed by postpartum 15 (33%) and intrapartum 9 (20%).

In our study, Eclampsia was seen in 20% of patients at term gestation and 63.9% preterm which is different from a study done by Khanum M et al.⁹, i.e. 53% at term gestation and 63.9% at near-term gestation. 40% of patients had 3-6 episodes of convulsions and 19% had more than 6 convulsions. There is a significant correlation between maternal death and the number of convulsions. At the time of presentation 6 patients had normal BP recording, 96 had mild and 167 had severe hypertension and Mattar F et al¹⁰ quoted 16% of the patients had no hypertension, 30%-60% had mild hypertension and 20%-54% had severe hypertension. Hypertension is considered to be the hallmark for the diagnosis of eclampsia. The diagnosis of eclampsia is usually associated with proteinuria (at least 1+ on dipstick). In our study, 13.6% had 3+, 81.8% had 2+, 4.5% had 1+ which is not like the study done by Mattar et al.

Vaginal delivery was the common mode of delivery in our study (76%) while 23.8% of cases underwent cesarean section. Common indication for cesarean section were CPD, failed induction and malpresentation. Akhtar R et al¹⁰ found that about 45% delivered spontaneously, 28.7% had instrumental delivery while 19.6% had caesarean section.

Eclampsia itself is not an indication for cesarean section, and mode of delivery had no significant effect on the outcome of the eclamptic as per Ibrahim A et al. In our study there was a significant impact on the maternal and perinatal outcome by mode of delivery. The definitive treatment of eclampsia is delivery. Attempts to prolong pregnancy in order to improve fetal maturity are unlikely to be of any value.

Labour is usually induced with prostaglandins and early

rupture of membranes. The obstetrician can monitor and await vaginal delivery once the patient is stable and convulsions are under control. Depending on the gestational age of the fetus, fetal well-being, presence or absence of amniotic fluid, Bishop score and maternal condition, a caesarean section may be performed. Prudent and prompt selection of cases for either vaginal delivery or cesarean section has positive impact on the maternal and perinatal outcome. The shorter the convulsion - delivery interval, the better is the prognosis. All our patients received magnesium sulfate as per Prichard's regimen to prevent convulsion. Efficacy of magnesium sulfate in prophylaxis and management of eclamptic convulsions is proven and trustworthy. Third delay in reaching to the hospital and higher number of convulsions increases maternal morbidity and mortality. It was found that there were 22(8.3%) maternal deaths or case fatality rate. Out of 87 deaths, 22 were because of eclampsia in a year(25.2%). Sarkar M et al (2011)¹¹, observed that Eclampsia accounted for 45.36% of total maternal death (total death 97) recorded within 4 year period, with case fatality rate 4.96%. The most common causes of maternal death are pulmonary edema and acute renal failure secondary to abruption placenta and multi-organ failure. There were 39.5% perinatal deaths due to eclampsia.

The most common causes of perinatal death are fetal asphyxia, prematurity, fetal growth restriction and acidosis. Perfect quality antenatal services can diagnose preeclampsia, and its appropriate management can reduce the incidence of eclampsia and subsequent morbidity and mortality. Vigorous and prompt management of eclampsia will reduce the maternal and perinatal morbidity and mortality. Unfortunately, 95.5% who died had a first pregnancy; maternal mortality was higher in those who had longer convulsion delivery interval. Deranged renal and liver profiles were significantly associated with adverse maternal outcome. In our perinatal study mortality was high in patients who had more than 6 convulsions, vaginally delivered, babies less than 2 kgs, urine albumin >2+. Eclampsia stands first in maternal mortality with morbidity.

Maternal morbidity includes severe bleeding from abruption placentae with its resulting coagulopathy, pulmonary edema, aspiration pneumonia, acute renal failure, cerebrovascular haemorrhage, retinal detachment and PRES. Perinatal mortality and morbidity is another impact factor in eclampsia patients, as the definitive treatment is the only termination of pregnancy irrespective of gestational age. The primary target in eclampsia is achieving control of convulsions, control of blood pressure and terminating pregnancy within optimal time frame. At all health providing levels appropriate use of anticonvulsants, anti-hypertensives along with safe culmination of pregnancy should be encouraged for these patients. If need is felt referral to a well-equipped higher center should be done promptly without wasting time along with by appropriate emergency obstetric care.

At the end of the study we suggest the following measures to improve the outcome of these cases:

1. At least 5 antenatal visits must be made compulsory for a patient, and the appointments must be more frequent during the 3rd trimester of pregnancy.
2. The health worker in the periphery should be sensitized regarding the importance of BP recording in the

pregnant mother, and the sign of severe preeclampsia and imminent eclampsia must be explained to them. The health workers are the roots of PHC; their active participation would result in early referral and prevention of morbidity and mortality due to preeclampsia and eclampsia.

3. As the government is providing finance for institutional deliveries, it can also offer financial incentives to antenatal checkups in the institution.
4. A mobile unit consisting of trained doctors with all facilities can be constituted, and this mobile unit can provide at least fortnightly visits to the periphery for better antenatal care.

CONCLUSION

Eclampsia is associated with significant maternal and perinatal morbidity and mortality. The higher death is due to high percentage of the patient being unbooked; majority receive no therapeutic intervention until admission. Darbhanga Health Centre is a referral centre for the poor peripheral districts where there is a lot of poverty, lack of awareness and inadequate antenatal services. All these lead to delay in the diagnosis, and early detection of warning symptoms is preceding eclampsia, like, edema, headache, nausea, vomiting, epigastric pain, blurring of vision and thereby delay in management, leading to various complications and resulting high mortality and morbidity.

Maternal and newborn deaths due to preeclampsia/ eclampsia are preventable: by increasing community awareness about the condition, improving antenatal care quality, and scaling up proven best practices to prevent mild preeclampsia's escalation to severe pre-eclampsia and eclampsia. By detecting and managing pre-eclampsia, judiciously, thus preventing eclampsia, can improve the survival rate of women and babies in developing countries.

In conclusion, the first mantra to prevent the morbidity and mortality related to eclampsia is better antenatal care which will depend not just on the presence of trained health workers but also on the awareness of the patients regarding prenatal care.

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