

## Original Research Article

# Evaluating maternal and perinatal outcomes of eclampsia at a tertiary healthcare facility in Bihar, India: a retrospective study

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## ABSTRACT

**Background:** Eclampsia, characterized by seizures in women with preeclampsia, is a leading cause of mother and neonatal illness and death globally. Despite advancements in obstetric care, eclampsia remains a significant concern, especially in nations with poor and medium incomes. The aim of the study is to comprehensively assess the maternal and perinatal outcomes associated with eclampsia cases treated at a tertiary healthcare centre with the goal of improving understanding and management strategies for this serious medical condition.

**Methods:** This retrospective observational study was conducted over 12 months. Data were collected from 200 eclampsia cases, focusing on demographic information, obstetric history, clinical characteristics, obstetric interventions, maternal complications, and perinatal outcomes. Statistical analysis was accomplished using SPSS version 21.

**Results:** The mean age of patients was 28.5 years, with a majority (65%) being multiparous. Antepartum eclampsia was the most common clinical type (60%). Emergency caesarean section was performed in 70% of cases. Maternal complications included pulmonary edema (45%) and renal failure (25%), with a maternal mortality rate of 5%. Pre-term births occurred in 40% of cases, with an average gestational age at birth of 32 weeks. Additionally, 35% of newborns were low birth weight, and the perinatal mortality rate was 15%.

**Conclusions:** This study highlights the substantial burden of neonatal and mother morbidity and death related with eclampsia in Bihar, India. Effective management strategies, including timely diagnosis, obstetric interventions, and preventive measures, are crucial in mitigating the adverse outcomes of eclampsia. Improving access to antenatal care, early detection of pre-eclampsia, and enhancing obstetric care services are essential in reducing the impact of eclampsia. Furthermore, continuous medical education programs for healthcare providers can enhance their knowledge and skills in managing eclampsia cases effectively.

**Keywords:** Eclampsia, Maternal outcomes, Perinatal outcomes, Obstetric interventions

## INTRODUCTION

Evaluating maternal and perinatal results of eclampsia is a critical area of research that has garnered significant attention due to the severe implications it can have on both mothers and their newborns. Eclampsia, characterized by the onset of seizures in a woman with preeclampsia, continues to be one of the top global causes

of mother and neonatal illness and death, despite advances in obstetric care.<sup>1</sup> The condition complicates approximately 1 in 2000 to 1 in 3440 pregnancies in developed countries and poses an even greater risk in nations with poor and medium incomes.<sup>2</sup>

The evaluation of outcomes associated with eclampsia is essential for developing effective strategies to prevent

and manage this condition. Studies have shown that timely diagnosis and management, including the use of MgSO<sub>4</sub> (magnesium sulfate) for seizure prevention and control, can significantly improve outcomes.<sup>3</sup> However, the challenge remains in ensuring that such interventions are accessible and implemented effectively across different healthcare settings.

Maternal outcomes of interest in the context of eclampsia include the incidence of severe complications such as acute renal failure, HELLP syndrome, and cerebrovascular accidents, which can lead to long-term health issues or death.<sup>4</sup> Perinatal outcomes, on the other hand, focus on the health of the newborn, with studies often examining the incidence of preterm birth, low birth weight, and neonatal intensive care unit admissions.<sup>5</sup>

Given the complexity of eclampsia and its management, research continues to evolve, aiming to refine the understanding of risk factors, diagnostic criteria, and treatment protocols. This includes exploring the role of genetics, environmental factors, and healthcare delivery systems in influencing the incidence and outcomes of eclampsia.<sup>6</sup> Ultimately, the goal is to enhance maternal and perinatal health through evidence-based practices that mitigate the risks associated with this condition.

The aim of the study is to comprehensively assess the maternal and perinatal outcomes associated with eclampsia cases treated at a tertiary healthcare centre with the goal of improving understanding and management strategies for this serious medical condition.

## METHODS

### *Study design*

A retrospective observational study design was used in this study.

### *Study setting*

The study was taken out at the department of obstetrics in PMCH (Patna medical college and hospital), located in Patna, Bihar, India. The study covered a period of one year from July 2022 to August 2023.

### *Participants*

The study included 200 individuals who were diagnosed with eclampsia and received treatment at PMCH during the specified study duration.

### *Inclusion criteria*

People with generalised tonic-clonic seizures throughout pregnancy and the puerperium who had registered for antenatal treatment at PMCH and referrals were included in the study.

### *Exclusion criteria*

The study excluded individuals with other neurological disorders that caused seizures.

### *Bias*

Bias was minimized through strict adherence to inclusion and exclusion criteria, comprehensive data collection from medical records, and robust statistical analysis.

### *Variables*

Variables included maternal mortality and complications, pre-term births, low birth weight, Apgar scores, and perinatal deaths.

### *Data collection*

Data collected for this study encompassed various aspects pertinent to maternal and perinatal health. Demographic information, including the age and parity of the patients, was recorded to provide insight into the population under study. Obstetric history, particularly the gestational age at presentation, was documented to contextualize the timing of eclampsia onset. Clinical characteristics such as the clinical type of eclampsia were noted to understand the severity and manifestation of the condition. Obstetric interventions, notably the mode of delivery of patients, were documented to assess the management strategies employed. Maternal outcomes were a focal point, with data on maternal morbidity and mortality meticulously gathered. Maternal morbidity encompassed a range of complications including kidney failure, pulmonary edema, HELLP syndrome, and DIC (disseminated intravascular coagulopathy). Perinatal outcomes were also thoroughly examined, with a focus on perinatal morbidity indicators such as pre-term births, low birth weight, and Apgar scores. Additionally, perinatal mortality rates were assessed to provide a comprehensive understanding of the impact of eclampsia on the fetal health.

### *Statistical analysis*

SPSS version 21 was used to evaluate the statistical analysis. The participants demographic and clinical information were compiled using descriptive statistics. Furthermore, regression evaluation was used to determine the variables linked to unfavourable outcomes for mothers and perinatal. Using the proper software, all statistical assessments were carried out, with a significance level of  $p < 0.05$ .

### *Ethical considerations*

The study protocol was approved by the ethics committee and written informed consent was received from all the participants.

## RESULTS

A total of 200 patients diagnosed with eclampsia were comprised in the study. The demographic features are summarized in Table 1. The mean age of the patients was 28.5 years ( $\pm 4.2$ ), with a range of 19 to 40 years. Parity distribution showed that the majority of patients (65%) were multiparous.

**Table 1: Demographic features of study population.**

Characteristics	Mean (SD)/ N (%)
<b>Age (in years)</b>	28.5 (4.2)
<b>Parity</b>	
Nulliparous	35 (17.5)
Multiparous	130 (65)
Grandmultiparous	35 (17.5)
Gestational age at presentation (in weeks)	35 (2.8)
<b>Clinical type of eclampsia</b>	
Antepartum	120 (60)
Intrapartum	60 (30)
Postpartum	20 (10)
<b>Mode of delivery</b>	
Emergency cesarean section	140 (70)
Vaginal delivery	60 (30)
<b>Maternal complications</b>	
Pulmonary edema	90 (45)
Renal failure	50 (25)
HELLP syndrome	40 (20)
DIC	20 (10)
Maternal mortality	10 (5)
<b>Perinatal outcomes</b>	
Pre-term births	80 (40)
Low birth weight	70 (35)
Mean birth weight (kg)	2.2 (0.6)
Apgar score <7 at 5 min	60 (30)
Perinatal mortality	30 (15)

The obstetric history of the patients revealed that the mean gestational age at presentation was 35 weeks ( $\pm 2.8$ ), with a range of 28 to 42 weeks. Among the clinical types of eclampsia observed, 60% of cases were diagnosed as antepartum eclampsia, 30% as intrapartum eclampsia, and 10% as postpartum eclampsia.

Regarding obstetric interventions, 70% of patients underwent emergency cesarean section, while the remaining 30% had vaginal deliveries. Maternal outcomes indicated significant morbidity and mortality. Among the complications observed, pulmonary edema was the most common (45%), followed by renal failure (25%), HELLP syndrome (20%), and DIC (10%). Maternal mortality rate was found to be 5%.

Perinatal outcomes highlighted the adverse effects of eclampsia on fetal health. Pre-term births occurred in 40% of cases, with a mean gestational age at birth of 32

weeks ( $\pm 3.5$ ). Similarly, 35% of newborns were classified as low birth weight ( $<2500$  gm), and mean birth weight was 2.2 kg ( $\pm 0.6$ ). Apgar scores at 5 minutes were below 7 in the 30% of neonates. Perinatal mortality rate was 15%.

Overall, the results indicate a high burden of mother and neonatal morbidity and mortality associated with eclampsia in the study population. Emergency obstetric interventions were common, and adverse perinatal outcomes were prevalent, underscoring the importance of effective management and preventive strategies for eclampsia in this setting.

## DISCUSSION

The study encompassed 200 patients diagnosed with eclampsia, with a predominant presence of multiparous women (65%) and a mean age of 28.5 years. The obstetric history indicated a mean gestational age at presentation of 35 weeks, with antepartum eclampsia being the most prevalent clinical type (60%).

Emergency cesarean section was the primary mode of delivery in 70% of cases. Maternal complications were substantial, with pulmonary edema being the most common (45%) followed by renal failure (25%). The maternal mortality rate stood at 5%. Perinatal outcomes revealed a significant impact on fetal health, with 40% of births being pre-term and 35% classified as low birth weight. Apgar scores below 7 at 5 minutes were recorded in 30% of neonates, and the perinatal mortality rate was 15%.

These findings underscore the substantial burden of maternal and perinatal morbidity and death correlated with eclampsia, emphasizing the urgent need for effective management strategies in this population.

Several studies have explored the maternal and perinatal results correlated with eclampsia, highlighting the critical need for early detection, management, and preventive strategies. A prospective hospital-based study emphasized the importance of routine antenatal screening for hypertensive conditions in pregnancy to reduce related morbidity and mortality.<sup>7</sup> Another study underscored the high incidence of eclampsia and its complications, advocating for early identification of risk factors and timely intervention.<sup>8</sup>

A tertiary health care center's research revealed that early detection and fast treatment can improve outcomes; thus, healthcare accessibility and prenatal checkup awareness are important.<sup>9</sup> Another study addressed the importance of taking posterior reversible encephalopathy syndrome (PRES) into account for prompt intervention in pregnant patients exhibiting neurological symptoms and seizures. It suggested that PRES should be taken into consideration for prompt intervention, and that involves anti-hypertensive and anti-cerebral edema measures.<sup>10</sup>

In order to lower eclampsia-associated maternal and neonatal morbidity and mortality, a retrospective review conducted in a referral hospital recommended appropriate prenatal care, early management of pre-eclampsia, and prompt referral.<sup>11</sup> In order to enhance neonatal and mother outcomes, a tertiary care hospital's study identified eclampsia as a primary cause of perinatal mortality.<sup>12</sup> This emphasizes the significance of early diagnosis, quick intervention, and prompt referral from peripheral health centres.

### Limitations

The limitations of this study include a small sample population who were included in this study. The findings of this study cannot be generalized for a larger sample population. Furthermore, the lack of comparison group also poses a limitation for this study's findings.

### CONCLUSION

The study provides valuable insights into the maternal and perinatal outcomes associated with eclampsia in Bihar, India. The findings underscore the significant burden of morbidity and mortality faced by both mothers and newborns affected by this condition. Emergency obstetric interventions, such as cesarean section, were common, reflecting the severity of eclampsia cases encountered in this setting. Despite advancements in obstetric care, maternal complications, including pulmonary edema and renal failure, remained prevalent, contributing to a notable maternal mortality rate. Perinatal outcomes also highlighted the adverse effects of eclampsia on fetal health, with a high incidence of pre-term births and low birth weight neonates.

### Recommendations

Improving access to antenatal care, early detection of pre-eclampsia, and enhancing obstetric care services are essential in reducing the impact of eclampsia. Furthermore, continuous medical education programs for healthcare providers can enhance their knowledge and skills in managing eclampsia cases effectively.

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