

MATERNAL AND FETAL OUTCOME OF ANTEPARTUM ECLAMPSIA IN A TERTIARY CARE HOSPITAL

V.G.Poorani¹, P.Anbarasi², P.Banupriya³

Received : 12/07/2026
Received in revised form : 08/08/2026
Accepted : 22/08/2026

Keywords:

Intraosseous vancomycin; total knee arthroplasty; periprosthetic joint infection; antibiotic prophylaxis; surgical-site infection; nephrotoxicity.

Corresponding Author:

Dr. V.G.Poorani,

Email: vgpoorani@gmail.com

DOI: 10.47009/jamp.2026.8.4.321

Source of Support: Nil,
Conflict of Interest: None declared

Int J Acad Med Pharm
2026; 8 (4); 1893-1902



¹Assistant Professor, Department of OBG, Chengelpet Medical College, Tamilnadu Dr MGR Medical University, India.

²Assistant Professor, Department of OBG, Chengelpet Medical College, Tamilnadu Dr MGR Medical University, India.

³Assistant Professor, Department of OBG, Thiruvanamalai Medical College, Tamilnadu Dr MGR Medical University, India.

ABSTRACT

Background: Hypertensive disorders are the most common medical emergencies affecting 12-22% of all pregnancies. Eclampsia continues to be a significant cause of maternal and fetal mortality and morbidity in developing countries. 44% of the seizures occur postpartum, 32% occur antepartum and 18% occur during intrapartum. The provision of proper obstetric care is essential for its management. Therefore it is worthwhile to review this significant problem periodically and our study aims to determine the maternal and fetal outcomes in mothers with antepartum eclampsia. **Materials and Methods:** This is a retrospective observational study conducted at Chengalpattu medical college and hospital from September 2021 to August 2024 spanning three years. The study involved 50 pregnant women who developed antepartum eclampsia during their hospital stay at admission based on inclusion criteria. The medical records of these patients were reviewed after obtaining consent and ethical clearance and information about patients background and maternal factors were collected. **Results:** During the three year period of 3720 deliveries, the incidence of antepartum eclampsia was found to be 1.34%. The mean age of the patients were 26.2 $\pm$ 3.6 years. 22 (44%) patients developed eclampsia during 33-36 weeks of gestation and the mean gestational age at delivery was found to be 33.4 $\pm$ 4.8. 28(56%) were delivered by cesarean section due to fetal Indications. Among the mothers who developed eclampsia primigravida were more common 31 (62%) when compared to multigravida. The majority of patients presented with headache (44%) as their primary complaint. The associated signs include high blood pressure (72%), proteinuria at 60⁺ and oliguria 16% at admission. The result showed HELLP syndrome a significant risk factor and preterm birth in 62% with increased nicu admission rates of 24% due to low apgar at birth posing adverse neonatal outcomes. **Conclusion:** Antepartum eclampsia poses significant risk for both maternal and fetal health. Despite treatment advances, maternal mortality and morbidity remains concerning. Increased nicu admissions and higher rates of still births were also noted. Early recognition of symptoms like headache, blurred vision is crucial for improving maternal and fetal prognosis. Prompt and specialised care is essential to reduce adverse events and implementation of preventive strategies and early management protocols can significantly improve survival rates for both mothers and infants.

INTRODUCTION

Hypertensive disorders are the most common medical complication during pregnancy, impacting 12-22% of all pregnancies.^[1] The most severe form of these complications, eclampsia, occurs when preeclampsia progresses, leading to grand mal tonic-

clonic seizures in a patient with no other neurological or medical conditions.^[2] Eclampsia, a word of Greek origin meaning "flash of lightning," is characterized by high blood pressure, headaches, vision disturbances, and convulsions in pregnant women.³ Eclampsia poses a life-threatening emergency and remains a significant cause of maternal and perinatal

mortality globally. It is also the third most common direct obstetric factor contributing to maternal mortality.^[3] In the fetus, during eclampsia, the mother's elevated blood pressure reduces the fetus's blood supply, potentially leading to reduced oxygen and nutrients and resulting in adverse fetal outcomes.^[4] The Incidence density of Eclampsia is 1 in 2000 deliveries in developed countries and 1 in 100 to 1 in 1700 cases in developing countries.^[5] Despite being less common in developed nations, Eclampsia continues to be a significant cause of maternal and fetal mortality and morbidity in developing countries.^[6]

Antepartum Eclampsia poses a greater risk than postpartum Eclampsia.^[2] 44% of seizures occur postpartum, 38% occur Antepartum, and 18% occur during intrapartum period. In one Indian study, the prevalence of Eclampsia is reported to be 1.56%.^[6] Other Indian studies have reported the incidence of Eclampsia varies from 0.94 to 1.8% in all pregnancies.^[7] It is more prevalent in first-time mothers (primigravidae) at 75% and is five times more common in twin pregnancies than in singleton pregnancies. Eclampsia typically occurs between the 36th week and full-term pregnancy. Its incidence remains high in hospitals that admit unregistered cases. Globally, approximately 50,000 women die from Eclampsia each year, according to Doeley's estimation. In India, maternal mortality and morbidity rates due to eclampsia range from 8-14%.⁸ But another study conducted by Menon et al reported a low maternal mortality rate of 2.2%. Perinatal mortality rates range from 14.6% to 47.4%.^[9] Despite significant advancements in obstetrics, the incidence of Eclampsia and its associated complications has not notably decreased in our country over the past few decades.

The exact cause of convulsions in cases of Eclampsia is not yet fully understood. Complications can vary depending on factors related to the mother and the baby and the quality of care provided at different types of medical facilities. Maternal deaths associated with Eclampsia are often due to preventable factors such as postpartum hemorrhage (PPH), antepartum hemorrhage (APH), pulmonary edema, aspiration pneumonia, HELLP Syndrome (Hemolysis, Elevated liver enzymes and low platelets), premature separation of the placenta, coagulation failure, acute renal failure (ARF), and cerebrovascular hemorrhage.² Poor fetal outcomes are usually linked to iatrogenic prematurity, respiratory distress syndrome (RDS), intrauterine asphyxia, Fetal growth restriction (FGR), and intrauterine death (IUD). Furthermore, FGR can lead to long-term neurodevelopmental issues in children.^[4,10]

The provision of proper obstetric care is essential for management. It has been unequivocally proved that terminating a pregnancy eliminates the primary cause of disease. Therefore, when the vaginal delivery is not imminent, opting for the abdominal route can improve the maternal and fetal outcomes.^[11]

Improving antenatal care and promptly recognizing and treating severe preeclampsia in hospitals can reduce the incidence of Eclampsia.^[3] Ensuring easy access to healthcare facilities for nearly all pregnant women can aid in the timely detection and prevention of Eclampsia. However, there is a minority of patients in whom eclampsia may not be preventable.^[10] This is because even though the principles of management of hypertensive disorders of pregnancy (HDPs) are the same across the world, our disproportionate resource-limited settings are primarily posing challenges to the management and quality of care for HDPs. But ideally, it is a preventable disease or almost so. Therefore, it is worthwhile to review this significant problem in obstetric care periodically, and our study aims to do that. The primary objective of this study is to determine the maternal and fetal outcomes in mothers with Antepartum eclampsia.

Review of literature

In a descriptive observational study by Chimrani et al. from Shivpuri, India, the objective was to assess the Feto-Maternal Outcome of severe Preeclampsia.^[12] This study examined 112 Cases of severe preeclampsia. Among the 112 patients, the majority experienced headaches, with 44.64% reporting it as their primary complaint, followed by pedal edema (32.14%) and vomiting (18.75%).^[12] The most frequently reported maternal complications were PPH (16.07%), abruption placenta (9.82%), and HELLP (3.57%), while the most common Neonatal outcomes were preterm babies (73.21%) and low birth weight (25%).^[12]

A retrospective analytical study was conducted in Jammu and Kashmir, India, by Sharma et al. at a tertiary care hospital.^[13] They investigated 100 cases of antepartum eclampsia, collecting data from medical records, including demographic details, obstetric history, clinical presentation, and detailed maternal and fetal outcomes.^[13] The most common maternal complications included HELLP syndrome (15%), acute renal failure (12%), and pulmonary edema (10%).^[13] The maternal mortality rate reported was 6%. Fetal outcomes revealed 75% of cases had preterm delivery, 65% of neonates had low birth weight, and a perinatal mortality rate reported to be 25%.^[13]

Gavali et al. carried out a prospective observational study at multiple centres in Islampur, India, focusing on pregnant women with pregnancy-induced hypertension (including gestational hypertension, preeclampsia, and severe preeclampsia) to assess maternal and fetal outcomes.^[14] Their findings revealed a 19.44% incidence of severe preeclampsia and a 7.87% incidence of eclampsia.^[14] Maternal complications observed included postpartum haemorrhage (8.80%), abruptio placentae (7.87%), and partial HELLP syndrome (6.94%).^[14] Most newborns had birth weights exceeding 2500 grams (72.59%) and APGAR scores of 8 or higher at 5 minutes' post-birth (90.24%).^[14] The study reported

a stillbirth rate and neonatal death rate of 3.24% respectively.

Mahale et al. conducted an observational study at the Governmental Medical College in Aurangabad, India, to determine maternal and fetal outcomes in eclampsia.^[8] The study found that the incidence of eclampsia was 1.1%. Maternal mortality in eclampsia patients was 2.1% during the 2-year study. 57% of eclampsia cases were referred from primary health centres and private hospitals. Antepartum eclampsia was the most common type, accounting for 82.11% of cases.⁸ The neonatal outcomes revealed that 12% of the babies had a birth weight of less than 1000g, and unfortunately, 45% of the babies experienced neonatal death.^[8]

In a cross-sectional prospective study at Government Medical College Nagpur, Praveen Kumar et al. examined pregnant women with eclampsia and a gestational age >20 weeks who presented with convulsions.^[15] The study aimed to evaluate maternal and neonatal morbidity and mortality. A total of 43 patients were included in the study. The majority of patients exhibited symptoms such as headache (92%), nausea and vomiting (90%), and epigastric pain (32%).^[15] Severe complications, including disseminated intravascular coagulopathy (16.27%), renal failure (6.97%), and deranged hepatic functions (13.95%), were observed in a significant percentage of cases. Fetal outcomes revealed that 46.51% of cases were small for gestational age, 25.58% experienced intrauterine death, 34.88% had neonatal mortality, and the overall perinatal mortality rate was 60.46%.^[15]

A prospective study by Rani R et al. was carried out in Salem, India, over one year to examine the fetal and maternal outcomes in mothers with Antepartum Eclampsia.^[2] The study revealed that the incidence of Antepartum Eclampsia in the hospital was 0.7%.^[2] Among the 54 Antepartum Eclampsia patients, 3 (5.5%) maternal deaths and 18 (33%) cases of adverse maternal complications were reported.^[2] Out of 50 live babies, 16 (32%) did not survive neonatally.^[2] The research concluded that Eclampsia remains a significant and common obstetric emergency with a substantial impact on maternal and fetal well-being.

MATERIALS AND METHODS

Study design and setting

This retrospective observational study was conducted in the Department of Obstetrics and Gynecology at Chengalpattu Medical College and Hospital, Chengalpattu from September 2021 to August 2024, spanning three years. The study's primary aim was to analyze the maternal and fetal outcomes of patients who developed antepartum Eclampsia.

The study involved 50 pregnant women who developed antepartum Eclampsia during their hospital stay or were admitted to the Department of Obstetrics and Gynecology with Antepartum

Eclampsia, was included in this study with utmost ethical considerations. It also encompassed all 50 infants born to women with Eclampsia. The medical records of these patients were reviewed for an Eclampsia diagnosis from between September 1, 2021, and August 31, 2024, as determined by the obstetrician. Prior to the study, verbal consent from the patients was obtained through telephone conversations, ensuring the integrity of our research. Information about the patient's background and maternal factors was gathered from the institution's existing data. This information encompassed gestational age (in years), socioeconomic status, level of education, Antenatal history, obstetric history, menstrual history, medical and surgical history, delivery mode, onset of Eclampsia, received treatment, and maternal and fetal complications.

Inclusion Criteria

In the study, individuals with a blood pressure reading equal to or greater than 160/110 mmHg, along with 1+ or more albuminuria, Pedal edema in the feet, and convulsions were included.

Exclusion Criteria

1. Patients experiencing seizures from causes other than eclampsia, such as epilepsy, CVTs, infection, and trauma were excluded.
2. Additionally, those with thyrotoxicosis, chronic renal disease, systemic lupus erythematosus, connective tissue disorders, and mild preeclampsia were also not part of the study.
3. Patients with hepatic and cardiac diseases were not included in the study.

Sample size and sampling method

A previous study had reported the incidence of maternal complication (Antepartum hemorrhage) among pregnant women with antepartum eclampsia was 14%,^[16] and therefore, the Sample size formula for a single proportion with absolute precision was used

$$n \geq \frac{Z^2 \cdot \frac{1-\alpha}{2} \cdot X \cdot P \cdot (1 - P)}{d^2}$$

$$\text{Alpha}(\alpha) = 0.05$$

Estimated prevalence = 14 %

Marginal error rate (d) = 0.10

sample size = 47

The minimum sample size calculated was 47, and we recruited 50 patients for the study, exceeding the minimum requirement. We opted to use a non-probability random sampling technique known as convenient sampling to enroll Rh-negative mothers in this study. This method was chosen as part of our quality assurance sampling procedures to collect relevant data pertaining to the study's objectives.

Ethical committee approval

The study was conducted according to the guidelines of the Declaration of Helsinki. The Institutional Ethics Committee of Chengalpattu Medical College provided ethical clearance for the study on 23/11/2023.

Operational definition

Chronic Hypertension

Chronic hypertension during pregnancy (HDP) is diagnosed when blood pressure (BP) exceeds 140/90 mmHg before the onset of pregnancy or before the 20th week of pregnancy.

Preeclampsia^[17]

Preeclampsia is characterized by the presence of high blood pressure (BP > 140/90 mmHg) accompanied by proteinuria (>300 mg/24 hours) in women who were previously normotensive. Severe preeclampsia

Severe preeclampsia^[17]

It is diagnosed when a pregnant woman's blood pressure is higher than 160/110 mmHg, lab results show signs of hemolysis, low platelet count, and elevated liver enzymes (known as HELLP syndrome), or when she experiences symptoms such as headache, blurred vision, upper abdominal pain, and protein in the urine.

Eclampsia^[17]

Eclampsia is characterized by the presence of convulsions and unconsciousness without other cerebral disorders in women with preeclampsia. The convulsions are typically grand mal seizures and may occur before, during, or up to 48 hours after childbirth.

Maternal near miss^[1]

It was described as women who lived through a serious pregnancy-related complication marked by any clinical or laboratory dysfunction of vital organs (such as the heart, lungs, brain, kidneys, liver, or uterus).

Maternal outcomes^[18]

Maternal outcomes include hemorrhagic stroke, acute kidney injuries (AKI), HELLP syndrome (Hemolysis, Elevated Liver enzymes, and Low Platelet count), heart failure, pulmonary edema, coagulopathy, PPH, APH and mortality.

Fetal outcomes^[18]

It includes stillbirths, fetal growth restriction, low birth weight, an APGAR score of < 7 at five minutes, NICU admission, and mortality within seven days following delivery. Low birth weight is defined as a birth weight of <2500 grams, while stillbirth is defined as a birth weight of 500 grams or less in a newborn neonate with no evidence of life.

Data collection procedure

In our study, we found that symptoms of preeclampsia preceded the majority of eclampsia cases. We reviewed and short-listed the patient records containing symptoms such as convulsions, upper abdominal pain, breathlessness, coma, palpitations, pedal edema, headache, blurred vision, and elevated BP from the MRD. Subsequently, we identified those with a confirmed diagnosis of eclampsia. We gathered details on maternal demographics, clinical characteristics, and neonatal outcomes. Maternal demographics encompassed age in years, education level, marital status, occupation, and geographical residence. Obstetric characteristics included gestational age in weeks, history of pregnancy loss, past history of eclampsia and

preeclampsia, and parity status. Patients were categorized as nulliparous, multiparous, or grand multiparous based on their parity. Multiparous denoted a patient who has had ≤ 4 births, while grand multiparous referred to a patient with ≥ 5 births at ≥ 28 weeks of gestation, irrespective of the outcome. Additionally, we documented comorbidities such as diabetes mellitus, chronic hypertension, hyperthyroidism, kidney disease, coagulation disorders, HIV/AIDS, venous thromboembolism, anemia, malnutrition, and mental health disorders.

We documented the details of medications given for chronic hypertension or preeclampsia during antenatal care, as well as the treatment for eclamptic seizures, including magnesium sulfate (MgSO₄) and antihypertensive drugs like labetalol or hydralazine, nifedipine, and corticosteroids for fetal lung maturity. We also recorded delivery details, including the mode of delivery, indication for C-section, and induction details.

In our study, we focused on maternal outcomes such as hemorrhagic stroke, acute kidney injuries (AKI), HELLP syndrome (Hemolysis, Elevated Liver enzymes, and Low Platelet count), heart failure, pulmonary edema, coagulopathy, and mortality¹⁹. We confirmed the presence of hemorrhagic stroke using CT scan results and verified kidney injuries through tests for renal function. Additionally, we diagnosed HELLP syndrome using laboratory tests, including complete blood count, abnormal peripheral blood smear indicating intravascular hemolysis, increased serum bilirubin, and elevated LDH levels. The neonatal outcomes we included were stillbirths, APGAR score < 7 at five minutes, NICU admission, and mortality within seven days following delivery¹⁹. We also included newborns with fetal growth restriction and low birth weight in our analysis of neonatal outcomes.

Data compilation and analysis

The data was collected and recorded in an Excel spreadsheet and then imported into Statistical Package for the Social Sciences (SPSS) version 20 for analysis. The patients' demographic, obstetric and delivery-related profiles were summarized using descriptive statistical methods such as bar charts and pie charts. Proportions and percentages were used for categorical variables. The Kolmogorov-Smirnov test was used to determine the normality in the quantitative data. The statistical significance was judged by a p-value of < 0.05 and narrow 95% confidence intervals (CI). The chi-square test with Yates correction was used to compare the categorical variables based on their outcomes. The odds ratio and 95% confidence interval (CI) for maternal and fetal adverse outcomes were calculated using binary logistic regression.

RESULTS

The retrospective observational study was conducted at a tertiary care hospital in Chengalpattu from

September 2021 to August 2023, involving 50 pregnant women diagnosed with Antepartum Eclampsia. During the three-year study period, 3,720 deliveries were conducted, and the incidence of antepartum eclampsia was found to be 1.34%. The study aimed to assess the maternal and neonatal outcomes in pregnant women with Antepartum eclampsia.

The age range of the patients varied from 18 to 36 years. The majority of cases (36%) were in the age group of 26 to 30 years, followed by 32% in the ≤ 20 years' age range and 28% in the 21 to 25 years' age range. [Figure 1]

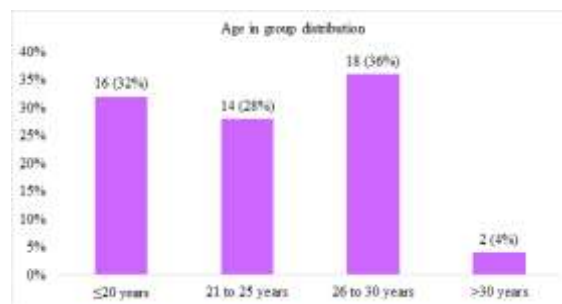


Figure 1: Age distribution of the patients

The mean age of the patients was 26.2 years $\pm$ 3.6 years, with a median age of 25 years. The majority of the patients (98%) were married, and most lived in rural areas (64%). Around 40% of the patients had completed high school. According to BG Prasad's classification based on per capita income, the majority of the patients belonged to Class IV (36%) and Class V (38%). [Table 1]

Table 1: Baseline demographic and general characteristics of patients

S.no	Characteristics	n (%)
1.	Mean age ($\pm$ SD) in years	26.2 ($\pm$ 3.6)
	Minimum age (in years)	18
	Maximum age (in years)	36
2.	Marital status	
	Married	49 (98%)
	Unmarried	1 (2%)
3.	Type of residence	
	Rural	32 (64%)
	Urban	18 (36%)
4.	Educational status	
	Illiterate	2 (4%)
	Primary and middle school	13 (26%)
	High school	20 (40%)
	Graduate and above	15 (30%)
5.	Socio economic status (Modified BG Prasad classification)	
	Class II	1 (2%)
	Class III	12 (24%)
	Class IV	18 (36%)
	Class V	19 (38%)

Table 2 provides information on the obstetric-related characteristics of the participants. The average gestational age of the patients who developed antepartum eclampsia was 33.4 $\pm$ 4.8 years. Most (44%) delivered between 33 and 36 weeks, and the patients diagnosed with Antepartum eclampsia had a gestational age at delivery ranging from 26.4 to 37.4 weeks. In this study, 31 patients (62%) were primiparous women, while 18 patients (36%) were multiparous women (Figure 2). When asked about their current antenatal visits, the majority of the 39 (78%) participants reported that they attended more than four antenatal visits. Additionally, 86% had booked status in the antenatal registration book, and 52% received antenatal care at a tertiary care teaching

hospital. With regard to the mode of delivery, a significant number of them (56%) underwent Caesarean delivery, with the main indications being failed induction (26.8%) and fetal distress (42.9%). From the reviewed records, 27 (54%) had spontaneous labour, and 23 (46%) had induced labour. Most of them had a history of abortion, with 7 (14%) having one abortion and 3 (6%) having more than one abortion in their lifetime.

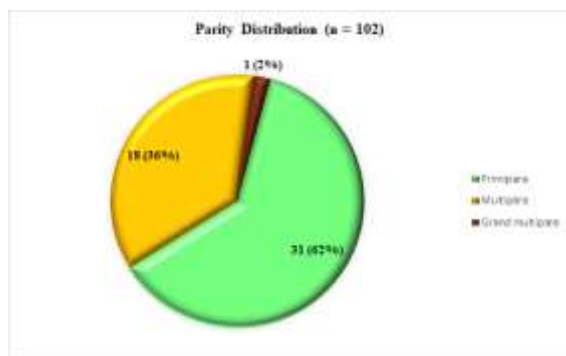


Figure 2: Parity status of the patient

Table 2: Baseline obstetric related characteristics of patients

	Maternal variables	N = 102
1.	Mean gestational age ($\pm$ SD) in weeks at delivery	33.4 $\pm$ 4.8
	Minimum gestational age (in weeks)	26.6 weeks
	Maximum gestational age (in weeks)	37.4 weeks
2.	Gestational age, n (%)	
	≤ 28 weeks	4 (8%)
	29 – 32 weeks	6 (12%)
	33 – 36 weeks	22 (44%)
	≥ 37 weeks	18 (36%)
3.	Antenatal visits	
	< 4	11 (22%)
	> 4	39 (68%)
4.	ANC registration status, n (%)	
	Booked	43 (86%)
	Unbooked	7 (14%)
5.	Place of Antenatal care	
	Primary health center	12 (24%)
	Private clinic	9 (18%)
	Teaching hospital	26 (52%)
	No antenatal visits	3 (6%)
6.	Mode of delivery, n (%)	
	Vaginal	20 (40%)
	Caesarean	28 (56%)
	Instrumental	2 (4%)
7.	Indication for Caesarean delivery, n (%) [n = 28]	
	Failed induction	8 (28.6%)
	Fetal distress	12 (42.9%)
	Placenta Previa	2 (7.1%)
	Contracted pelvis	2 (7.1%)
	Unfavorable cervix	4 (14.3%)
8.	Mode of induction	
	Spontaneous	27 (54%)
	Induced	23 (46%)
	Oral misoprostol	14 (28%)
	PGE1 Gel	6 (12%)
	Foley's catheter	3 (6%)
9.	Number of abortions	
	None	40 (80%)
	1 abortion	7 (14%)
	>1 abortions	3 (6%)

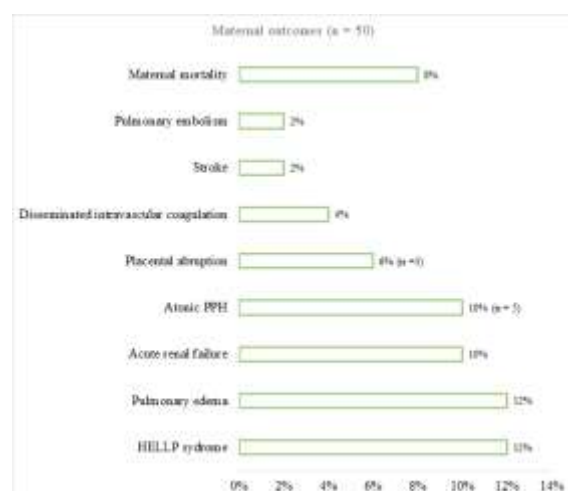
The majority of the patients reported headache as the primary symptom, accounting for 44.64%, followed by pedal edema at 32.14%, blurring of vision at 14%,

and upper abdominal pain (epigastric) at 12%. The associated signs included high blood pressure at 72%, proteinuria at 60%, and oliguria at 16%. [Table 3]

Table 3: Clinical signs and symptoms of patients

s.no.	Symptoms and Signs (n = 50)	n (%)
1.	Headache	32 (64%)
2.	Proteinuria (> 3 +)	30 (60%)
3.	High blood pressure (> 160/110 mm Hg)	36 (72%)
4.	Pedal edema	16 (32%)
5.	Blurring of vision	7 (14%)
6.	Upper abdominal pain	6 (12%)
7.	Oliguria (< 500ml/24 hours)	8 (16%)
8.	Altered sensorium	1 (2%)

The study revealed that HELLP syndrome and pulmonary edema were the most common maternal complications, occurring in 12% of cases. HELLP syndrome is characterized by hemolysis, elevated liver enzymes, and low platelet count. Acute renal failure and postpartum hemorrhage were observed in 10% of cases, which are other severe complications of eclampsia. The maternal mortality rate observed in this study was 8%. The remaining patients experienced placental abruption (6%) and disseminated intravascular coagulation (4%). A small number of patients (2%) suffered from a stroke and pulmonary embolism. The details of maternal outcomes are shown in Figure 3.

**Figure 3: Maternal outcomes in patients with Antepartum eclampsia**

The study utilized binomial logistic regression analysis to identify independent predictors associated with maternal mortality and possibly eliminate potential confounders. The results showed that HELLP syndrome was a significant risk factor for maternal mortality (AOR = 2.21; p-value < 0.01*). Additionally, individuals with high blood pressure (AOR = 1.63, p-value = 0.02*) and severe proteinuria (3+) (AOR = 1.41, p-value = 0.02*) are more likely to experience mortality, indicating a statistically significant association. Furthermore, oliguria (AOR = 1.34, p-value = 0.03*) was also significantly associated with maternal mortality in antepartum eclampsia. Detailed information is provided in Table 4.

Table 4: Factors associated with maternal mortality

Variable of interest	AOR	95% CI for AOR	p-value
HELLP syndrome	2.21	1.33 – 3.47	<0.01*
Acute renal failure	1.61	0.71 – 4.54	0.43
High Blood pressure (>160/110 mmHg)	1.63	1.11 – 2.41	0.02*
Proteinuria (> 3+)	1.41	1.17 – 1.67	0.02*
Oliguria	1.34	1.02 – 1.71	0.03*

In our study, we observed that the most common adverse fetal outcomes were preterm birth (62%) and low birth weight (56%). These findings indicate that eclampsia has a significant impact on fetal health. We also noted other adverse outcomes such as low Apgar scores (36%) and an increased need for NICU admission (24%). Additionally, we found that 8% of

cases resulted in neonatal mortality and stillbirth. Furthermore, 20% of babies experienced fetal growth restriction, while 16% suffered from birth asphyxia. [Figure 4]

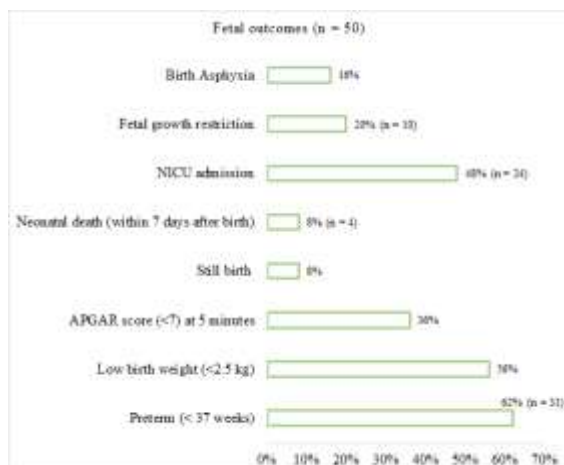


Figure 4: Fetal outcomes in patients with Antepartum eclampsia

The study results indicate that low birth weight was a significant risk factor for perinatal and neonatal mortality (AOR = 1.53; p-value = 0.02*). Furthermore, admission to the NICU increases the risk of perinatal and neonatal mortality by 1.90 times (AOR = 1.90, p-value = 0.04*), demonstrating a statistically significant association. The study also found that fetal growth restriction (AOR = 1.32, p-value = 0.02) increases the risk of neonatal mortality (AOR = 1.98, p-value = 0.05*), and this association was statistically significant. [Table 5]

Table 5: Factors associated with perinatal and neonatal mortality

Independent variable	AOR	95% CI for AOR	p-value
Preterm birth	1.34	0.86 – 6.27	0.44
Low birth weight	1.53	1.17 – 1.86	0.02*
APGAR score (<7 at 5 min)	1.28	0.61 – 4.56	0.41
NICU admission	1.90	1.23 – 3.48	0.04*
Birth Asphyxia	0.91	0.71 – 1.03	0.37
FGR	1.98	1.10 – 5.25	0.05*

DISCUSSION

In a retrospective observational study, researchers aimed to assess the maternal and fetal outcomes of patients who experienced antepartum eclampsia. The study revealed that 36% of the cases were in the 26-30 age group, with a mean age of 26.2 years $\pm$ 3.6 years. Most patients (64%) residing in rural areas, and around 40% had completed high school. Based on BG Prasad's classification by per capita income, most patients belonged to Class IV (36%) and Class V (38%). Another retrospective cohort study by Lal et al. compared the outcomes of patients admitted with eclampsia or seizure in labour to those with preeclampsia. They found that the mean age of the eclamptic population was 26.1 years old, compared to 27.8 years old in the preeclampsia group.^[20] Additionally, a study by Bhalero et al. aimed to determine the rate of eclampsia in antenatal women and analyze the maternal and perinatal outcomes in women with eclampsia.^[6] They reported that most patients were in the 25 to 30 age group and were from a low socio-economic status.^[6] In a longitudinal case-series study by Irene et al., it was found that most women with eclampsia were in the age group of 20-34 years (62.3%), and most of them had a secondary level of education (56.6%).^[18] The study also reported that most were married (56.6%) and came from rural locations (88.7%).^[18] Our study revealed that the average gestational age at presentation for women with antepartum eclampsia

was 33.4 $\pm$ 4.8 years. Most of them (44%) delivered between 33 and 36 weeks. In our study, most women (62%) were primiparous, and most (78%) reported attending more than four antenatal visits. Additionally, 86% reported having booked status in the antenatal registration when asked about the place of antenatal care. 52% reported receiving care at tertiary care teaching hospitals. Mousa et al. reported that the mean gestational age for patients with severe preeclampsia was 33.32 weeks.^[11] In comparison, the mean gestational age for patients without severe preeclampsia was 36 weeks, which aligns with our findings. Mahale et al. reported that 55.82% of the total eclampsia patients were primiparous, followed by multiparous women.^[8] Similar to our study, Rani R et al. reported that only 97% of cases were booked, with primiparous comprising 56%.² Another Indian study also showed that the mean gestational age at presentation was 31 weeks, with 60% of cases presenting between 28 and 34 weeks of gestation. Similar to our findings, they also mentioned that the majority (80%) had more than four antenatal visits.^[13] Our research observed that 56% of the participants underwent Caesarean delivery. The primary indications for this mode of delivery were failed induction (26.8%) and fetal distress (42.9%). Additionally, 54% of the participants experienced spontaneous rather than induced labour. A study by Priyanka et al. yielded similar results, with 49.28% of deliveries being Caesarean sections, and the primary indications were failed induction (46.3%) and fetal

distress (24.7%).^[21] Vaginal delivery accounted for 38.57% of the cases in their study. Another Indian study also reported a high percentage (52%) of spontaneous labour, which is consistent with our findings.^[22] Among our participants, the most commonly reported primary symptom was headache (44.64%), followed by pedal edema (32.14%) and blurring of vision (14%). Saxena et al. reported similar findings, with headache being the main symptom among 150 patients, followed by oedema in the feet.^[23] Other concurrent symptoms included blurred vision, oliguria, and epigastric pain, aligning with our results.^[23]

The study found that HELLP syndrome and pulmonary edema were the most common maternal complications (12%), followed by acute renal failure and postpartum hemorrhage (10%) of cases. The maternal mortality rate was 8%. Regression analysis revealed that HELLP syndrome, high blood pressure, and severe proteinuria were significantly associated with maternal mortality. A study by Sharma et al. also reported that HELLP syndrome was the most common complication, occurring in 15%, followed by acute renal failure (12%) and pulmonary edema (10%). The overall maternal mortality rate was 6%. The study further added that HELLP syndrome was significantly associated with other adverse maternal outcomes, including ICU admission and death.

In our study, the most common adverse fetal outcomes were preterm birth (62%) and low birth weight (56%), followed by low APGAR scores (36%) and an increased need for NICU admission (24%). The neonatal mortality and stillbirth reported in our study was 8%. Our study also found that low birth weight, admission to the NICU, and fetal growth restriction increase the risk of perinatal and neonatal mortality, and this association was statistically significant. Chimrani et al. also reported that preterm birth (73.21%) was the most common fetal complication, followed by low birth weight (25%) and IUGR (17.85%). In their study, 43.75% of babies required NICU admission, and the perinatal mortality rate was 16.07%. Xavier et al. studied women admitted with severe preeclampsia and eclampsia and found that women with preeclampsia/eclampsia had significantly higher risks of cesarean section (adjusted RR - 2.14) and preterm delivery at <34 weeks' gestation (adjusted RR - 2.50) than women with chronic hypertension, which is consistent with our results.

CONCLUSION

Antepartum eclampsia poses significant risks for both maternal and fetal health. Maternal complications include seizures, HELLP syndrome, pulmonary edema, acute renal failure, and postpartum hemorrhage. Despite treatment advances, maternal mortality and morbidity remain concerning. Fetal outcomes often involve prematurity, low birth weight, and intrauterine growth restriction (IUGR),

leading to increased NICU admissions and higher stillbirth rates. Early recognition of symptoms like headaches, blurred vision, and upper abdominal pain is crucial for improving maternal and fetal prognosis. Prompt and specialized care is essential to reduce adverse outcomes, and implementing prevention strategies and early management protocols can significantly improve survival rates for both mothers and infants.

REFERENCES

1. Barbosa IRC, Silva WBM, Cerqueira GSG, Novo NF, Almeida FA, Novo JLVG. Maternal and fetal outcome in women with hypertensive disorders of pregnancy: the impact of prenatal care. *Therapeutic Advances in Cardiovascular Disease* [Internet]. 2015 Aug [cited 2024 Oct 20];9(4):140–6. Available from: <https://journals.sagepub.com/doi/10.1177/1753944715597622>
2. R. AR, R. DJ, S. E. Study of maternal and fetal outcome in antepartum eclampsia in a tertiary care hospital. *Int J Reprod Contracept Obstet Gynecol* [Internet]. 2018 Feb 27 [cited 2024 Oct 20];7(3):1108. Available from: <http://www.ijrcog.org/index.php/ijrcog/article/view/4331>
3. Dixit P, Mishra TK, Nargawe D, Singh S. Maternal and Perinatal Outcome in Patients With Eclampsia: A Study Done at a Tertiary Care Centre. *Cureus* [Internet]. 2023 Sep 26 [cited 2024 Oct 20]; Available from: <https://www.cureus.com/articles/191059-maternal-and-perinatal-outcome-in-patients-with-eclampsia-a-study-done-at-a-tertiary-care-centre>
4. Xavier IM, Simões ACZ, Oliveira RD, Barros YE, Sarmento ACA, Medeiros KSD, et al. Maternal-fetal outcomes of women with hypertensive disorders of pregnancy. *Rev Assoc Med Bras* [Internet]. 2023 [cited 2024 Oct 20];69(6):e20230060. Available from: http://www.scielo.br/scielo.php?script=sci_arttext&pid=S0104-42302023000600609&tlng=en
5. Junior Resident, Department of Obstetrics and Gynaecology, BMCRI, Bangalore., Aliya Fatima S, Bharati G, Junior Resident, Department of Obstetrics and Gynaecology, BMCRI, Bangalore., Saahiti P, Junior Resident, Department of Obstetrics and Gynaecology, BMCRI, Bangalore., et al. MATERNAL AND PERINATAL OUTCOME IN WOMAN WITH ANTEPARTUM ECLAMPSIA. *IJAR* [Internet]. 2023 May 31 [cited 2024 Oct 20];11(05):1085–95. Available from: <https://www.journalijar.com/article/44953/maternal-and-perinatal-outcome-in-woman-with-antepartum-eclampsia/>
6. Joshi S, Ghike S, Bhalerao A, Kawthalkar A, Kulkarni S. Eclampsia: Maternal and Fetal Outcome. *Journal of South Asian Federation of Obstetrics and Gynaecology* [Internet]. 2013 Apr [cited 2024 Oct 20];5(1):19–21. Available from: <https://www.jsafog.com/doi/10.5005/jp-journals-10006-1212>
7. Lnu A, Lnu D. Maternal and Perinatal Outcome in Severe Preeclampsia and Eclampsia. *Journal of South Asian Federation of Obstetrics and Gynaecology* [Internet]. 2009 Dec [cited 2024 Oct 20];1(3):25–8. Available from: <https://www.jsafog.com/doi/10.5005/jp-journals-10006-1005>
8. Mahale RS, Gadappa SN. Study of maternal and fetal outcome in eclampsia at Government Medical college, Aurangabad, Maharashtra, India. *Int J Reprod Contracept Obstet Gynecol* [Internet]. 2019 Feb 26 [cited 2024 Oct 20];8(3):932. Available from: <https://www.ijrcog.org/index.php/ijrcog/article/view/6111>
9. Menon MKK. THE EVOLUTION OF THE TREATMENT OF ECLAMPSIA*. *BJOG* [Internet]. 1961 Jun [cited 2024 Oct 20];68(3):417–26. Available from: <https://obgyn.onlinelibrary.wiley.com/doi/10.1111/j.1471-0528.1961.tb02747.x>
10. Nobis PN, Hajong A. Eclampsia in India Through the Decades. *J Obstet Gynecol India* [Internet]. 2016 Oct [cited 2024 Oct 20];66(S1):172–6. Available from: <http://link.springer.com/10.1007/s13224-015-0807-5>

11. Mousa A, Mandili RL, Aljahdali M, Gari S, Khaimi S, Alahdal S, et al. Maternal and Fetal Outcomes of Preeclampsia With and Without Severe Features in King Abdulaziz University Hospital, Jeddah, Saudi Arabia: A Retrospective Study. *Cureus* [Internet]. 2022 Nov 2 [cited 2024 Oct 20]; Available from: <https://www.cureus.com/articles/118616-maternal-and-fetal-outcomes-of-preeclampsia-with-and-without-severe-features-in-king-abdulaziz-university-hospital-jeddah-saudi-arabia-a-retrospective-study>
12. Jayshree C, Gupta K, Jain U, Jain S, Jain, Shammii, Jain, Gaurav. Feto-maternal outcome in Severe Pre-eclampsia. *JAMP*. 2022 Dec 25;5(1):392–7.
13. Sharma N, Shekhar C. Assessing Maternal and Fetal Outcomes in Cases of Antepartum Eclampsia. *JAMP*. 3(2):205–8.
14. Gavali S. Study of fetomaternal outcome in patients with pregnancy induced hypertension at Sangli district. *MJOBG* [Internet]. 2021 [cited 2024 Oct 22];20(2):65–9. Available from: https://medpulse.in/Gynecology/html_20_2_5.php
15. Praveenkumar AM, Patil R, Pachpande V. Maternal and Fetal Outcome in Eclampsia. *AIMDR* [Internet]. 2017 Feb 19 [cited 2024 Oct 22];3(2). Available from: http://www.aimdrjournal.com/pdf/vol3Issue2/OG1_OA_V3N2.pdf
16. Aabidha P, Cherian A, Paul E, Helan J. Maternal and fetal outcome in pre-eclampsia in a secondary care hospital in South India. *J Family Med Prim Care* [Internet]. 2015 [cited 2024 Oct 21];4(2):257. Available from: <https://journals.lww.com/10.4103/2249-4863.154669>
17. Raghuraman N, March MI, Hacker MR, Modest AM, Wenger J, Narcisse R, et al. Adverse maternal and fetal outcomes and deaths related to preeclampsia and eclampsia in Haiti. *Pregnancy Hypertension: An International Journal of Women's Cardiovascular Health* [Internet]. 2014 Oct [cited 2024 Oct 21];4(4):279–86. Available from: <https://linkinghub.elsevier.com/retrieve/pii/S2210778914001019>
18. Irene K, Amubuomombe PP, Mogeni R, Andrew C, Mwangi A, Omengo OE. Maternal and perinatal outcomes in women with eclampsia by mode of delivery at Riley mother baby hospital: a longitudinal case-series study. *BMC Pregnancy Childbirth* [Internet]. 2021 Dec [cited 2024 Oct 21];21(1):439. Available from: <https://bmcpregnancychildbirth.biomedcentral.com/articles/10.1186/s12884-021-03875-6>
19. Akaba GO, Anyang UI, Ekele BA. Prevalence and maternal-fetal outcomes of preeclampsia/eclampsia amongst pregnant women at a teaching hospital in north-central Nigeria: a retrospective cross-sectional study. *Clin Hypertens* [Internet]. 2021 Dec [cited 2024 Oct 21];27(1):20. Available from: <https://clinicalhypertension.biomedcentral.com/articles/10.1186/s40885-021-00178-y>
20. Lal AK, Gao W, Hibbard JU. Eclampsia: Maternal and neonatal outcomes. *Pregnancy Hypertension: An International Journal of Women's Cardiovascular Health* [Internet]. 2013 Jul [cited 2024 Oct 22];3(3):186–90. Available from: <https://linkinghub.elsevier.com/retrieve/pii/S2210778913000548>
21. Priyanka DR. Maternal and perinatal outcome in severe preeclampsia and eclampsia. *jmscr* [Internet]. 2020 Jun 13 [cited 2024 Oct 22];08(06). Available from: <http://jmscr.igmpublication.org/v8-i6/45%20jmscr.pdf>
22. Singhal SR, Nanda S. Maternal and Perinatal Outcome in Severe Pre-eclampsia and Eclampsia.
23. Saxena N, Bava A, Nandanwar Y. Maternal and perinatal outcome in severe preeclampsia and eclampsia. *Int J Reprod Contracept Obstet Gynecol* [Internet]. 2016 [cited 2024 Oct 22];2171–6. Available from: <http://www.ijrcog.org/index.php/ijrcog/article/view/1321>