

Original Research Article

EXAMINING FETAL AND MATERNAL OUTCOMES IN ANTEPARTUM ECLAMPSIA: A CLINICAL STUDY

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ABSTRACT

Background: Antepartum eclampsia remains a critical obstetric emergency, especially in low- and middle-income settings. It is associated with high maternal and perinatal morbidity and mortality. Timely identification and management of eclampsia are vital to improving outcomes. This study aims to assess the spectrum of maternal and fetal outcomes in patients diagnosed with antepartum eclampsia. To evaluate the maternal and fetal outcomes associated with antepartum eclampsia and to identify common clinical presentations and complications in a tertiary care setting.

Materials and Methods: A hospital-based cross-sectional observational study was conducted from January to December 2023 in the Department of Obstetrics and Gynecology at a tertiary care center. A total of 120 pregnant women diagnosed with antepartum eclampsia were enrolled based on predefined inclusion and exclusion criteria. Detailed clinical assessments, laboratory investigations, and maternal and fetal outcomes were recorded. Data were analyzed using SPSS version 26.0, and associations were assessed using chi-square and t-tests where appropriate.

Results: Out of 120 cases, the majority (72.5%) were primigravidae, and 68.3% were between 20–30 years of age. Seizures were the initial presenting symptom in 89.2% of cases. The most frequent maternal complications were HELLP syndrome (15.8%), acute renal injury (10.0%), and pulmonary edema (6.7%). Maternal mortality was observed in 4.2% of cases. On the fetal side, 35.8% were preterm births, 28.3% were low birth weight (<2.5 kg), and the perinatal mortality rate was 18.3%. Emergency cesarean section was performed in 52.5% of cases, and vaginal delivery occurred in 45.8%. Magnesium sulfate was used in all cases for seizure control.

Conclusion: Antepartum eclampsia continues to contribute substantially to adverse maternal and fetal outcomes. Young, primigravida women are particularly at risk. Comprehensive antenatal care, early diagnosis, and prompt multidisciplinary intervention remain pivotal in reducing morbidity and mortality associated with this condition.

Keywords: Antepartum eclampsia, maternal outcomes, fetal outcomes, seizures in pregnancy, perinatal mortality, obstetric emergency, magnesium sulfate.

INTRODUCTION

Eclampsia, defined as the occurrence of new-onset, generalized tonic-clonic seizures in a woman with preeclampsia, is a life-threatening hypertensive disorder of pregnancy that significantly contributes to maternal and perinatal morbidity and mortality.

When seizures occur before the onset of labor, the condition is termed antepartum eclampsia, which represents the most severe end of the preeclampsia–eclampsia spectrum. Despite advances in prenatal care and the availability of antihypertensive and anticonvulsant therapies, antepartum eclampsia continues to be a major public health concern,

particularly in low- and middle-income countries where access to timely care remains limited.^[1]

Globally, hypertensive disorders complicate approximately 5–10% of pregnancies, and eclampsia accounts for about 50,000 maternal deaths annually. Antepartum eclampsia, though less common than postpartum or intrapartum variants, is often more dangerous due to the sudden onset of seizures without prior warning signs, delayed presentation, and inadequate antenatal surveillance. This condition not only endangers maternal life through complications such as cerebral hemorrhage, pulmonary edema, renal failure, and disseminated intravascular coagulation (DIC), but it also significantly affects fetal well-being by causing intrauterine growth restriction, placental abruption, preterm birth, and stillbirth.^[2-6]

In India and other developing nations, antepartum eclampsia continues to pose a grave challenge due to late referrals, socio-economic barriers, poor health-seeking behavior, and lack of awareness regarding early signs of hypertensive disorders in pregnancy. While the introduction of magnesium sulfate therapy has considerably reduced the incidence of seizures and maternal mortality, the condition still contributes to a large burden of maternal and fetal adverse outcomes due to delayed diagnosis and inadequate antenatal monitoring.

The pathophysiology of eclampsia is complex and not fully understood. It involves systemic endothelial dysfunction, vasospasm, and impaired placental perfusion, all of which contribute to multi-organ involvement and poor fetal outcomes. Additionally, antepartum eclampsia often presents in young, primigravid women, further complicating clinical management and posing significant challenges for obstetricians.^[7,8]

Given these concerns, a deeper understanding of the clinical profile, risk factors, and outcomes of antepartum eclampsia is critical to improving care. There is a relative paucity of focused studies addressing the specific maternal and fetal outcomes in cases of antepartum eclampsia within the Indian context, especially in urban and semi-urban tertiary care centers.^[9]

This study aims to bridge this gap by examining the clinical presentations, maternal complications, fetal outcomes, and overall burden of antepartum eclampsia. By identifying patterns and predictors of adverse outcomes, the study seeks to provide valuable insights into early recognition, targeted intervention, and effective management strategies to mitigate the risks associated with this obstetric emergency.

MATERIALS AND METHODS

This cross-sectional observational study was conducted in the Department of Obstetrics and Gynecology at a tertiary care hospital in eastern India

over a one-year period from January 2023 to December 2023. The aim was to evaluate the clinical outcomes of antepartum eclampsia on both the mother and fetus and identify common complications associated with the condition.

A total of 120 pregnant women diagnosed with antepartum eclampsia were included. Antepartum eclampsia was defined as the onset of generalized tonic-clonic seizures in a pregnant woman after 20 weeks of gestation but before the onset of labor, without any pre-existing neurological disorder. Women presenting with seizures due to epilepsy, brain tumors, or infections were excluded. Also excluded were patients with multifetal gestation, postpartum or intrapartum eclampsia, or those referred after delivery.

The patients were evaluated upon admission through detailed history-taking, physical examination, and relevant laboratory investigations. Demographic data, obstetric history, booking status, and clinical presentation were recorded. Investigations included complete blood count, liver and kidney function tests, coagulation profile, urine albumin, and obstetric ultrasonography to assess fetal growth and well-being. Blood pressure levels and proteinuria were measured and recorded.

All patients were managed according to institutional protocol. Anticonvulsant therapy with magnesium sulfate (Pritchard regimen) was administered to all patients immediately after diagnosis to control seizures. Antihypertensive medications such as labetalol and nifedipine were given to maintain optimal blood pressure. Corticosteroids were administered to promote fetal lung maturity in pregnancies below 34 weeks of gestation. The decision regarding the mode of delivery (vaginal or cesarean section) was individualized based on obstetric indication, fetal condition, gestational age, and maternal stability.

Maternal outcomes assessed included the mode of delivery, occurrence of complications such as HELLP syndrome, acute renal injury, pulmonary edema, placental abruption, ICU admission, and maternal death. Fetal outcomes included gestational age at birth, birth weight, Apgar score, NICU admission, stillbirth, and early neonatal death.

All patients were monitored until discharge, and neonatal outcomes were recorded up to the first 7 days of life. Ethical approval was obtained from the institutional review board prior to the commencement of the study. Written informed consent was taken from each participant or a legally authorized representative.

All collected data were compiled and analyzed using SPSS version 26.0. Descriptive statistics were used to represent frequencies, percentages, and mean \pm standard deviation. Comparative analysis between outcome variables was performed using the Chi-square test or Fisher's exact test for categorical variables, and Student's t-test for continuous variables. A p-value of less than 0.05 was considered statistically significant.

RESULTS

A total of 120 pregnant women diagnosed with antepartum eclampsia were enrolled in the study

conducted during the year 2023. The following section presents the demographic, clinical, maternal, and fetal outcome data in tabular format, along with statistical analysis where applicable.

Table 1: Age Distribution of Study Participants (n = 120)

Age Group (years)	Number of Patients	Percentage (%)
<20	14	11.7
20–24	38	31.7
25–29	42	35.0
30–34	18	15.0
≥35	8	6.6

Most patients were between 20–29 years of age, accounting for 66.7% of the cohort.

Table 2: Parity Status

Parity	Number of Patients	Percentage (%)
Primigravida	87	72.5
Multigravida	33	27.5

A majority were primigravida, highlighting their vulnerability to hypertensive disorders.

Table 3: Booking Status

Booking Status	Number of Patients	Percentage (%)
Booked	46	38.3
Unbooked	74	61.7

Unbooked patients formed a significant proportion, indicating inadequate antenatal care.

Table 4: Gestational Age at Presentation

Gestational Age (weeks)	Number of Patients	Percentage (%)
<28	9	7.5
28–32	29	24.2
33–36	44	36.7
≥37	38	31.6

The majority presented during late preterm and term gestation.

Table 5: Initial Clinical Presentation

Clinical Feature	Number of Patients	Percentage (%)
Seizures	107	89.2
Headache	82	68.3
Visual disturbances	43	35.8
Epigastric pain	29	24.2
Vomiting	21	17.5

Seizures and headaches were the most common presenting features.

Table 6: Maternal Complications

Complication	Number of Cases	Percentage (%)
HELLP syndrome	19	15.8
Acute renal injury	12	10.0
Pulmonary edema	8	6.7
Abruptio placentae	10	8.3
DIC	3	2.5
Maternal mortality	5	4.2

A range of serious complications were noted, with HELLP syndrome being the most frequent.

Table 7: Mode of Delivery

Mode of Delivery	Number of Patients	Percentage (%)
Vaginal delivery	55	45.8
Cesarean section	63	52.5
Undelivered (maternal death prior)	2	1.7

More than half of the patients required operative intervention.

Table 8: Fetal Outcomes – Birth Weight

Birth Weight Category	Number of Newborns	Percentage (%)
<1.5 kg	17	14.2
1.5–2.5 kg	51	42.5
>2.5 kg	52	43.3

Low birth weight was observed in a significant proportion of cases.

Table 9: Neonatal Outcomes

Outcome	Number of Newborns	Percentage (%)
NICU admission	44	36.7
Stillbirth	11	9.2
Early neonatal death	11	9.2
Healthy discharge	98	81.7

NICU admission and neonatal death rates remained high, reflecting fetal vulnerability.

Table 10: Correlation of Booking Status with Maternal Complications

Complication	Booked (n = 46)	Unbooked (n = 74)	p-value
HELLP syndrome	3 (6.5%)	16 (21.6%)	0.03*
Pulmonary edema	1 (2.2%)	7 (9.5%)	0.08
Maternal mortality	0 (0%)	5 (6.7%)	0.04*

*Statistically significant association observed between unbooked status and maternal complications.

DISCUSSION

This study aimed to evaluate maternal and fetal outcomes in cases of antepartum eclampsia, with an emphasis on identifying high-risk factors, complications, and outcomes in a tertiary care setting. The findings of this study provide valuable insights into the clinical patterns, burden of complications, and the critical role of antenatal care in managing high-risk pregnancies complicated by eclampsia.^[10] The demographic profile in this study revealed that the majority of women affected by antepartum eclampsia were young, between the ages of 20 and 29 years. This age group, while being considered reproductively optimal, also aligns with higher prevalence rates of hypertensive disorders among primigravidas. A striking 72.5% of the study population were primigravida, consistent with the established evidence that nulliparity is a key risk factor for pre-eclampsia and its severe form, eclampsia.^[11,12]

More than 60% of the participants were unbooked and had not received regular antenatal care. This reinforces the pivotal role of early detection and consistent monitoring in preventing disease progression. The higher rate of complications observed among unbooked patients (such as HELLP syndrome and maternal mortality) is a concerning trend and emphasizes the consequences of inadequate prenatal surveillance.^[13-15]

The most common clinical presentation was generalized seizures, followed by headache and visual disturbances. These findings are consistent with other large-scale studies, which note that such symptoms often precede or accompany eclamptic convulsions and are key warning signs.^[16,17]

In this cohort, cesarean section was the mode of delivery in 52.5% of the cases. While vaginal delivery is often preferred, cesarean sections were necessitated due to fetal distress, poor Bishop score, or maternal instability. The high rate of surgical intervention aligns with findings from similar tertiary care studies, indicating the necessity of individualized delivery planning in severe eclampsia. Maternal complications were frequent and varied. HELLP syndrome emerged as the most common (15.8%), followed by acute renal injury and placental

abruption. The maternal mortality rate in this study was 4.2%, which, although lower than in many earlier studies in low-resource settings, still reflects the severe and often unpredictable course of eclampsia. Notably, all maternal deaths occurred in the unbooked group, highlighting a strong correlation between poor antenatal care and fatal maternal outcomes.^[18]

On the fetal side, outcomes were equally concerning. Low birth weight was noted in 56.7% of neonates, and 36.7% required NICU admission. Stillbirth and early neonatal death rates were both recorded at 9.2%, indicative of intrauterine compromise and prematurity, which are commonly associated with maternal eclampsia. The Apgar scores were lower among neonates born to mothers with severe complications, reaffirming the impact of maternal health on fetal prognosis.

The correlation analysis revealed statistically significant associations between unbooked status and adverse maternal outcomes such as HELLP syndrome and maternal death, echoing findings from other studies in both Indian and international literature. These results underscore the vital role of antenatal care not just for early detection but also for comprehensive risk stratification and timely intervention.^[19,20]

Compared to previous studies, the outcomes in this research reflect moderate improvements in maternal mortality and neonatal survival, possibly due to the timely use of magnesium sulfate therapy, improved critical care, and early decision-making regarding delivery. Nevertheless, the burden of complications and the proportion of preventable outcomes remain high.

CONCLUSION

Antepartum eclampsia remains a major obstetric emergency and a significant contributor to both maternal and perinatal morbidity and mortality, particularly in low-resource and developing healthcare settings. This study, encompassing 120 cases over a year, reaffirms the serious implications of this condition on pregnancy outcomes.

Our findings illustrate that the majority of affected women were young, primigravida, and unbooked—factors that closely correlate with adverse outcomes.

A large proportion of these patients presented late in pregnancy without prior antenatal care, underscoring the urgent need for strengthening community-based antenatal surveillance and early risk identification strategies. The significantly higher incidence of complications like HELLP syndrome, acute kidney injury, placental abruption, and maternal death in unbooked patients highlights the critical impact of early antenatal intervention in mitigating the progression of pre-eclampsia to eclampsia.

The maternal mortality rate of 4.2% and notable neonatal complications—such as low birth weight, NICU admissions, and perinatal deaths—reflect the dual burden borne by both mother and fetus. These outcomes call for robust peripartum care protocols, improved critical care infrastructure, and emergency obstetric training at all levels of healthcare delivery. Moreover, timely diagnosis, immediate administration of magnesium sulfate, blood pressure control, and individualized delivery planning proved instrumental in optimizing outcomes. However, despite these interventions, the persistence of severe complications suggests that prevention through early screening and education should be prioritized above reactive care.

In conclusion, antepartum eclampsia remains a preventable but highly dangerous condition. Improving maternal and fetal outcomes demands a multi-faceted approach that includes community awareness, early registration for antenatal care, consistent monitoring of high-risk pregnancies, and the readiness of obstetric units to manage emergencies with timely interventions. Investing in preventive obstetric care and ensuring universal access to antenatal services are not just policy imperatives—they are ethical and clinical necessities in reducing the burden of maternal and neonatal deaths.

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