

**Analysis of Maternal and Perinatal Outcomes in Cases of Eclampsia at JLNMCH Bhagalpur: A Tertiary Care Center Study**Priyanka Kumari<sup>1</sup>, Rahul Ranjan<sup>2</sup>, Krishna Sinha<sup>3</sup><sup>1</sup>Senior Resident, Department of Obstetrics & Gynecology, Jawaharlal Nehru Medical College and Hospital, Bhagalpur, Bihar, India<sup>2</sup>Senior Resident, Department of Surgery, Jawaharlal Nehru Medical College & Hospital, Bhagalpur, Bihar, India<sup>3</sup>Associate Professor, Department of Obstetrics & Gynecology, Jawaharlal Nehru Medical College & Hospital, Bhagalpur, Bihar, India

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**Abstract:****Background:** Eclampsia remains a significant concern in developing countries, despite a decline in its incidence and mortality globally. This study, conducted from January to December 2023, aimed to investigate the incidence, demographic characteristics, clinical presentation, management, and outcomes of antepartum eclampsia.**Methodology:** This study included 60 pregnant women diagnosed with antepartum eclampsia. Data was collected through detailed patient history, physical and obstetric examinations, and a range of diagnostic tests. Treatment primarily consisted of magnesium sulfate administration, with some cases requiring a switch to phenytoin. Various maternal and perinatal outcomes were recorded, along with maternal complications, indications for cesarean sections, and the convulsion-to-delivery interval.**Results:** The study found prenatal eclampsia prevalence at 1.08%, with a majority of affected women in the 21-25 age group, predominantly housewives from lower socioeconomic backgrounds. Most patients were primigravidas and presented with symptoms such as headaches, pedal edema, and vision problems. Approximately half of the cases underwent cesarean sections, mainly due to fetal distress. Maternal complications were observed in 38% of cases, with a 4% maternal mortality rate. Neonatal outcomes indicated a high rate of preterm births, with 8% neonatal deaths.**Conclusion:** Despite a global decline in eclampsia incidence and mortality, this study's findings underscore its continued significance in certain regions. Enhancing maternal healthcare access, antenatal care, and awareness among vulnerable populations are crucial steps in addressing the burden of eclampsia and improving maternal and neonatal outcomes.**Recommendations:** The study highlights the ongoing challenge of eclampsia in the region, emphasizing the need for improved antenatal care, especially for women from lower socioeconomic backgrounds. Timely and adequate prenatal interventions, including regular check-ups and education, should be promoted to reduce the impact of this condition.**Keywords:** Eclampsia, Maternal Outcomes, Perinatal Outcomes, Antepartum Eclampsia, Developing Countries.This is an Open Access article that uses a funding model which does not charge readers or their institutions for access and distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>) and the Budapest Open Access Initiative (<http://www.budapestopenaccessinitiative.org/read>), which permit unrestricted use, distribution, and reproduction in any medium, provided original work is properly credited.**Introduction**

The word "eclampsia" comes from a Greek phrase that means "like a sudden flash of lightning." Similar to a stroke, eclampsia is a dangerous illness that frequently results in women's deaths, according to Alexander Hamilton in 1781. Unfortunately, some women experience serious difficulties that have a negative impact on the outcome of pregnancy. Eclampsia is still a serious emergency that contributes considerably to maternal and neonatal deaths worldwide. Maternal mortality rates varies considerably between regions, even

when management practices are almost the same, indicating possible variations in socioeconomic characteristics and the standard of obstetric care in each country.

4.9 cases of eclampsia occur for every ten thousand deliveries in the U.S [1]. Still, a far higher number of pregnancies globally remain complicated by eclampsia [2]. The stated incidence for India is 220 incidences for per 10,000 live births. Pregnancy-related hypertension diseases, especially eclampsia,

are thought to be responsible for about 7% of maternal mortality [3].

How often eclampsia occurs can be reduced by improved prenatal care, detection at early stage, and inpatient treatment of patients with severe preeclampsia. However, a small percentage of patients have eclampsia "Bolt from the Blue." We can provide assistance to these unhappy and uneducated people by minimising the mortality rate of eclampsia in both mothers and newborns by prompt intervention and therapy. We carried out this investigation to ascertain the prevalence of eclampsia, related problems, and impact on results for both mothers and foetuses.

The study's aim is to assess the outcomes for mothers and newborns in cases of eclampsia.

### Methodology

**Study Design:** Prospective study was conducted.

**Study Setting:** The research was conducted at Jawaharlal Nehru Medical College and Hospital (JLNMCH) Bhagalpur.

**Participants:** Participants hospitalised and treated in a maternity unit with antepartum eclampsia of hospital over a one year period were evaluated.

**Inclusion and Exclusion Criteria:** Among the requirements for inclusion are expectant mothers admitted to hospital with eclampsia during the study period, of all ages, with complete medical records. We will also include cases managed through various modalities. Exclusion criteria encompass transferred cases, incomplete records, historical cases, comorbidities, consent issues, and cases outside the study period or treated elsewhere, ensuring research quality and relevance.

**Study Size:** After fulfilling the inclusion criteria, 60 eclamptic patients in total had been added to the study.

**Data Collection and Analysis:** Data were collected prospectively from medical records of patients treated. The management of eclamptic patients as well as the mortality and morbidity rates for the mother and the foetus were monitored. Data was logged and examined. Maternal outcome was assessed based on the method of delivery, complications such as haemorrhage, brain haemorrhage, renal failure, pulmonary edoema, and maternal death. Neonatal mortality, NICU admission, and preterm were recorded as aspects of the perinatal outcome.

**Bias:** To minimize bias, the goal of the research was not disclosed to the participants or healthcare providers during data collection. Additionally, data analysts were blinded to the identity of the participants.

**Variables:** The entire hemogram with number of platelets, the blood group determination, HIV and hepatic antibody situation, STS (Syphilis) circumstance, clotting profile, liver function, renal function, full urine examination, and fundus examination were among the many factors covered by these tests. In addition, a mercury sphygmomanometer was used to carefully record the participant's blood pressure in the right arm while they were lying down, with the arm raised to the level of the heart. Korotkoff sound V was used to assess the participant's diastolic pressure.

**Statistical Analysis:** To collect and evaluate the data at the end of the study, the Chi-square test and the Fischer exact test were utilized. A cutoff of  $P < 0.05$  was established for significance.

**Ethical Considerations:** The study was carried out in accordance with ethical guidelines, which included getting each participant's informed consent. The ethics committee examined and approved the study protocol.

### Results

**Table 1: Study on Antepartum Eclampsia in Women (N=60)**

Parameter	Value/Percentage
<b>Study Period</b>	<b>Jan - Dec</b>
Total Number of Patients	60
Incidence of Antepartum Eclampsia	1.08%
<b>Age Group (years)</b>	
- 21-25	82%
- 26-30	10%
<b>Education Level</b>	
- Illiterate	18%
- Primary Education	36%
- Graduates/Postgraduates	4%
<b>Occupation</b>	
- Housewives	92%
<b>Socioeconomic Class</b>	
- Lower	80%
<b>Gravidity</b>	
- Primigravidas	74%

- Second Gravida	14%
- Third Gravida or More	12%
<b>Gestational Age (months)</b>	
- Less than 7 months	24%
<b>Booking Status</b>	
- Unbooked (Emergency)	98%
- Booked (Regular Antenatal Visits)	2%
<b>Common Presenting Symptoms</b>	
- Headache	60%
- Pedal Edema	22%
- Blurring Vision	10%
- Epigastric Discomfort	8%
<b>Magnesium Sulfate Usage</b>	
- Administered to Most Patients	
- Some Patients Switched to Phenytoin	5%
<b>Maternal Outcome</b>	
- Vaginal Delivery	48%
- Cesarean Section	52%
- Instrumental Delivery	14%
<b>Indications for Cesarean Section</b>	
- Fetal Distress	42.4%
- Malpresentation	7.7%
- Status Eclampticus	15.4%
- Obstructed Labour	3.8%
- Cephalopelvic Disproportion	3.8%
- Poor Bishop Score	26.9%
<b>Maternal Complications</b>	
- Status Eclampticus	12%
- Atonic Postpartum Hemorrhage (PPH)	2%
- Abruptio Placenta with DIC and Pulmonary Edema	2%
- Acute Renal Failure (ARF)	4%
- Aspiration Pneumonia	2%
- Disseminated Intravascular Coagulation (DIC)	4%
- Cerebral Venous Thrombosis	2%
- HELLP Syndrome	6%
- Postpartum Psychosis	2%
- Posterior Reversible Encephalopathy Syndrome	2%
- No Complications	62%
Maternal Mortality	4%
Hospital Stay (mean)	9 ± 2.48 days
<b>Perinatal Outcomes</b>	
- Preterm Gestations	48%
- Mean Baby Weight	2.00 ± 0.73 kg
- Neonatal Intensive Care Unit (NICU) Admissions	28%
- Neonatal Deaths	8%
<b>Convulsion-to-Delivery Interval</b>	
- <1 hour	10%
- 1-5 hours	58%
- >5-10 hours	22%
- >10 hours	10%

This study focused on women with antepartum eclampsia treated at hospital's maternity unit from January to December. Patients with a history of epilepsy, head injury, meningitis, or cerebral malaria were not included. After obtaining consent, we collected detailed medical histories and conducted physical and obstetric examinations. Various tests were performed, including blood

tests, blood pressure measurements, and urine examinations. Magnesium sulfate (MgSO<sub>4</sub>) was administered to most patients, while phenytoin was given to those with contraindications. Delivery methods varied based on indications, and labor was closely monitored

Antepartum eclampsia was prevalent in 1.08% in a cohort of 60 patients. The major part of eclamptic women (82%) were aged 21-25, with 18% being illiterate and 36% having primary education. Most were housewives (92%) from lower socioeconomic backgrounds. Primigravidas constituted three-quarters of cases (74%), while 98% of women presented as emergencies. The most prevalent symptom was headache (60%). Magnesium sulfate was initially administered to all patients. Delivery methods varied, with 52% undergoing cesarean sections. Complications were investigated in 38% of cases, with eclampticus being the most common (12%). The total mortality rate in eclampsia was 4%, with statistically significant differences observed between discharged and deceased patients. The perinatal outcomes showed 48% preterm births, with baby weight of  $2.00 \pm 0.73$ kg. Four neonatal deaths occurred, primarily due to prematurity. Convulsion-to-delivery intervals were associated with neonatal outcomes.

### Discussion

The study found that antepartum eclampsia during this period was 1.08%, indicating that it remains a concern in the region. Most of the affected women were in the 21-25 age group, had limited education levels, and worked as housewives. Additionally, a significant portion belonged to the lower socioeconomic class. The majority of patients were primigravidas, and some experienced eclampsia early in their pregnancies. Most patients had not received regular antenatal care. Common symptoms included headaches, pedal edema, vision problems, and epigastric discomfort. Magnesium sulfate was the primary treatment, but a small percentage had to switch to phenytoin due to toxicity. Cesarean sections were performed in 52% of cases, with fetal distress being the leading indication. Maternal complications were observed in 38% of cases, with status eclampticus being the most common. The maternal mortality rate was 4%, and the average hospital stay was nine days. Nearly half of the pregnancies were preterm, with neonatal intensive care unit admissions at 28% and neonatal deaths at 8%. The data underscores the need for improved prenatal care and timely intervention to reduce the impact of eclampsia in this population.

The incidence and mortality rates of eclampsia have witnessed a significant decline over recent decades, primarily attributed to advancements in prenatal care and improvements in social and economic conditions. However, despite these positive trends, eclampsia continues to pose a substantial threat to pregnant women, particularly in developing countries. In our study, we observed an incidence of eclampsia at 1.08%, a figure consistent with similar studies conducted in India [4]. To put this into perspective, developed nations

like the U.S report eclampsia in only 0.05% of total deliveries, underscoring the disparities in healthcare access and outcomes between developed and developing regions [1].

In our patient population, a majority of eclamptic women (82%) fell within the 21-25 years age with another 10% in the 26-30 years age group. These findings align with previous research indicating that eclampsia predominantly affects younger women. Eclampsia commonly occurring in the 18-22 years age group [5]. Educational attainment and socio-economic status emerged as significant factors in our study. The majority of eclamptic women had received an education level below primary schooling (54%), and only 4% had achieved graduate or postgraduate degrees. These findings mirror the observations, who reported that 75% of cases had an education level limited to primary schooling [6]. Notably, our study found that 80% of the patients belonged to a lower socio-economic stratum, consistent with the report that 95% of their patients were both not literate and from a poor social backgrounds [7]. It was also identified that 74% of their cases as originating from low socio-economic status [5].

Primigravida status was prevalent in our study, with 74% of women experiencing their first pregnancy, resulting in an average parity of  $0.3 \pm 0.7$ . These findings are in line who reported 60.5% primigravidas and 39.5% multigravidas [6]. Similarly, it was found that 79% of cases were primigravidas and 21% were multigravidas [8]. The occupational distribution showed that 92% of the eclamptic women in our study were housewives.

The most occurred symptom in our study was headache (60%), pedal edema (22%), and blurring of vision (10%). These findings align with reports by Sibai BM and Douglas and Redman, which indicated that headache and visual changes were among the most frequently reported symptoms in eclampsia patients [9, 10].

Regarding blood pressure, our study found that 54% of patients had systolic blood pressure readings exceeding 160 mmHg, and 56% had diastolic blood pressure readings exceeding 110 mmHg. It was observed that severe hypertension (>160/110) occurs in 66% of their cases [17] and 68% of cases as severe hypertensive [8].

Difficulties were observed in 38% of our cases, with eclampticus being the most common (12%). Other complications included postpartum hemorrhage (PPH) at 2%, abruptio placenta with disseminated intravascular coagulation (DIC) and pulmonary edema at 2%, acute renal failure (ARF) at 4%, aspiration pneumonia at 2%, cerebral venous thrombosis at 2%, HELLP syndrome at 6%, postpartum psychosis at 2%, and postpartum reversible encephalopathy syndrome at 2%.

Notably, maternal deaths occurred in 4% of cases [8].

In our study, 96% of women were discharged from the hospital, while 2 women tragically succumbed to eclampsia, resulting in a case fatality rate of 4%. This significant difference between discharged patients and maternal deaths was statistically significant ( $P = 0.0001$ ), likely attributable to the high level of care provided at hospital.

Regarding the mode of delivery, 52% of patients underwent caesarean section, while 48% had vaginal deliveries, with 29.2% of these being instrumental deliveries. These findings are consistent with reports by Arshad T and Ndaboine et al., which indicated varying proportions of caesarean sections and spontaneous vaginal deliveries [11, 6].

In most cases, the time between the initial convulsion and birth was less than five hours, correlating with good outcomes for both mothers and neonates. This observation aligns with the findings of Swain S, indicating that a shorter convulsion-to-delivery interval contributes to improved maternal and perinatal outcomes. Magnesium sulfate procedures were better in controlling convulsions in the majority (84.5%) of cases, consistent with the use of magnesium sulfate in the Prichards regimen by other studies [12].

Perinatal outcomes revealed 14 perinatal mortalities (28%), with early neonatal deaths accounting for 8% of cases. Prematurity was identified as the primary cause of neonatal deaths (75%). Notably, we observed 48% preterm births and 28% NICU admissions. These outcomes documented varying rates of perinatal mortality and neonatal [13, 14, 8].

### Conclusion

Eclampsia remains a formidable challenge in developing countries, primarily stemming from factors such as low educational attainment, impoverished socio-economic conditions, and limited access to antenatal care. Addressing this issue necessitates improved prenatal care, wider utilization of magnesium sulfate, timely delivery, and the effective implementation of emergency obstetric care facilities. It is only through these measures, combined with efforts to elevate the social and educational status of women, that we can hope to significantly reduce maternal and fetal mortality rates associated with eclampsia in these regions.

**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.

**Recommendation:** The study highlights the ongoing challenge of eclampsia in the region, emphasizing the need for improved antenatal care, especially for women from lower socioeconomic backgrounds. Timely and adequate prenatal interventions, including regular check-ups and education, should be promoted to reduce the impact of this condition.

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### List of Abbreviations:

1. JLNMC - Jawaharlal Nehru Medical College and Hospital
2. NICU - Neonatal Intensive Care Unit
3. MgSO<sub>4</sub> - Magnesium Sulfate
4. DIC - Disseminated Intravascular Coagulation
5. ARF - Acute Renal Failure
6. PPH - Postpartum Hemorrhage
7. HELLP Syndrome - Hemolysis, Elevated Liver enzymes, Low Platelet count Syndrome
8. ICD-10 - International Classification of Diseases, 10th Edition
9. STS - Syphilis
10. HIV - Human Immunodeficiency Virus
11. HBsAg - Hepatitis B Surface Antigen

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