# FETOMATERNAL OUTCOMES OF ECLAMPSIA AT LIAQUAT MEMORIAL TEACHING HOSPITAL KOHAT

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## ABSTRACT

*Background: Eclampsia remains a significant cause of maternal and fetal morbidity and mortality, particularly in resource-limited settings. Delays in diagnosis, inadequate antenatal care, and suboptimal management contribute to poor outcomes. Understanding the factors influencing fetomaternal outcomes can help improve management strategies and reduce complications.* **Objective:** *To evaluate the fetomaternal outcomes of eclamptic patients managed at Liaquat Memorial Teaching Hospital, Kohat, and identify preventable factors contributing to adverse outcomes.* **Study Design:** *Descriptive cross-sectional study.* **Setting:** *Liaquat Memorial Teaching Hospital, Kohat.* **Duration of Study:** *Six months (08/06/2024—08/12/2024).* **Methods:** *A total of 83 eclamptic patients diagnosed between 24 weeks of gestation and 42 days postpartum were included. Data collection involved detailed medical histories, physical examinations, and fetal monitoring. Standard management protocols included magnesium sulfate for seizure control, antihypertensive therapy, and obstetric interventions based on clinical assessment. Maternal outcomes assessed included acute kidney injury (AKI), pulmonary edema, and maternal mortality. Fetal outcomes recorded were intrauterine growth restriction (IUGR), preterm birth, and fetal mortality. Data analysis was performed using SPSS version 25, with descriptive statistics applied to assess frequencies and percentages.* **Results:** *The mean maternal age was 31.34 ±6.643 years, with an average gestational age of 35.95 ±2.85 weeks. Pre-eclamptic signs were observed in 83.1% of patients. Maternal complications included AKI in 4.8% of cases, pulmonary edema in 6.0%, and a maternal mortality rate of 7.2%. Among fetal outcomes, 47.0% of cases exhibited IUGR, while 49.4% were preterm births. Fetal mortality was recorded at 8.4%, with 91.6% of neonates surviving.* **Conclusion:** *Eclampsia remains a critical contributor to maternal and fetal morbidity and mortality. Early diagnosis, effective management, and enhanced antenatal care are essential for improving outcomes. Reducing delays in detection and referral, particularly in resource-constrained settings, is crucial to minimizing complications and enhancing maternal and neonatal survival.*

**Keywords:** Eclampsia, Maternal Mortality, Fetal Mortality, Intrauterine Growth Restriction, Preterm Birth, Secondary Care

## INTRODUCTION

Eclampsia symbolises a serious complication during pregnancy, marked by the occurrence of seizures in individuals suffering from hypertensive disorders. Eclampsia typically begins with new-onset seizures that can be either tonic-clonic, focal, or as multifocal; these seizures must occur without any underlying conditions like epilepsy and cerebrovascular events. Eclampsia typically occurs within the initial 48 hours after childbirth; nonetheless, it can manifest before, during, or following labour as well. The most likely occurrence is during the initial week following childbirth (1-3). Eclampsia can occasionally occur without any prior signs of preeclampsia, including hypertension and proteinuria. Eclampsia represents a major contributor to maternal mortality rates. Seizures may result in significant complications such as maternal hypoxia, trauma, as well as aspiration pneumonia; however, long-term neurological damage is infrequent. Certain women might encounter enduring cognitive deficits, especially following repeated seizures or unmanaged severe hypertension (4-7).

Magnesium sulphate is recognised as the primary treatment for the prevention and management of seizures in individuals with eclampsia. However, its application in pregnant patients with preeclampsia lacking severe features remains a topic of discussion. Management requires supportive measures, diligent checking of levels of magnesium to prevent toxicity, particularly in women with compromised renal function, and immediate delivery of the foetus (8-10). The occurrence of new-onset hypertensive conditions during pregnancy has increased by nearly 50% over the past 15 years, particularly in urban as well as rural areas (11). Preeclampsia is thought to be present in 3% to 8% of pregnancies; however, mortality rate is notably higher among younger patients, ranging from 5% to 20%. A recent study analysing nearly 28 million live births from 2009 to 2017 indicated that 0.3% of these cases were associated with eclampsia (12).

In a study conducted on 100 eclamptic women, five mothers died. Three infants were classified as having extreme low birth weight (1 kg), while 25.05% were categorized as having very low birth weight (1.0-1.5 kg). Forty-three percent of infants were classified as having low birth weight, ranging from 1.6 to 2.4 kg, while only 25 percent exceeded a birth weight of 2.4 kg, with a mean of 1.95 ± 0.63 kilograms. Among the live births, 80% were recorded, with 39% being over 37 weeks gestation and 61% under 37 weeks. The stillbirth rate stood at 20%, while 15% of the infants were classified as IUGR. A total of 75 babies, accounting for 75%, required resuscitation at birth because of low APGAR scores. Furthermore, 63% of the neonates were transferred to the neonatal intensive care unit. Respiratory issues developed in 60% of cases, primarily attributed to pre-maturity and asphyxia. The early neonatal death rate was 22%, and maternal mortality was noted at 5% (13). Another study on women with eclampsia recorded a mean gestational age of 35 weeks and a mean birth weight of 2.4 ± 0.8 kg. Maternal mortality was recorded at 0.8%, while perinatal mortality stood at 29.1% (14).

The rationale of this study is to assess the feto-maternal outcome of eclamptic patients managed at Liaquat Memorial Hospital, as such a research has not been conducted at our setup in the past, and this study will help to provide better management with limited resources

available at a secondary care hospital, and will possibly reduce morbidity and mortality.

## METHODOLOGY

The study employed a descriptive cross-sectional design to investigate the fetomaternal outcomes of eclampsia among patients presenting at the Department of Obstetrics and Gynecology, Liaquat Memorial Teaching Hospital, Kohat. The study duration was six months (08-06-2024—08-12-2024), and it was conducted following approval from the College of Physicians and Surgeons Pakistan (CPSP). The sample size was determined using OpenEpi software, with 83 participants included based on a 0.05% significance level calculation parameters, an expected frequency of 8.4% of hypothesized outcome, and a precision level of 6%. A consecutive sampling technique was employed to recruit patients meeting the inclusion criteria.

Inclusion criteria included women diagnosed with eclampsia after 24 completed weeks of gestation and up to 42 days postpartum, including those with a previous scarred uterus. Patients with anomalous babies or medical conditions causing convulsions or coma were excluded. Following informed consent, detailed histories were taken, and comprehensive physical examinations were conducted, including general, per-abdominal, and per-vaginal assessments. Fetal heart sounds and cardiotocography (CTG) were monitored for live fetuses. Management protocols adhered to institutional standards. Convulsions were controlled with magnesium sulfate following the Pritchard regimen, where a loading dose of 4 grams was administered intravenously over 10 minutes, followed by 5 grams intramuscularly in each buttock and subsequent maintenance doses every 4 hours for 24 hours. Blood pressure was managed using intravenous labetalol when indicated. The mode of delivery was determined based on obstetric indications. Patients in labor were monitored for progress, with induction or augmentation using prostaglandin E2 (PGE2) administered as per protocol. Cesarean section was performed for patients with obstetric indications.

Maternal outcomes, including acute kidney injury (AKI), pulmonary edema, and maternal mortality, were assessed. Pulmonary edema was defined as an abnormal accumulation of fluid in the lungs leading to dyspnea and hypoxia. At the same time, AKI was characterized by an abrupt decline in renal function within hours of onset. Fetal outcomes included intrauterine growth restriction (IUGR), preterm birth, and fetal mortality. IUGR was defined as birth weight below the 10th percentile for gestational age, and preterm birth referred to delivery before 37 completed weeks.

Data were systematically recorded on a pre-designed pro forma and analyzed using SPSS version 2023. Quantitative variables such as maternal age, gestational age, parity, gravidity, and BMI were described using mean ± standard deviation. Categorical variables, including the presence of preeclampsia signs, maternal mortality, AKI, pulmonary edema, fetal mortality, preterm birth, and IUGR, were presented as frequencies and percentages. Stratification was performed based on age, BMI, parity, gravidity, and gestational age. Post-stratification analysis was conducted using the chi-square test, with a significance level set at p < 0.05.

Patients were followed from admission through discharge or referral, with contact maintained in referral cases to ensure data completeness. This methodology aimed to evaluate eclampsia's maternal and fetal outcomes comprehensively, identify contributing factors to adverse consequences, and improve management practices and resource utilization in a secondary care hospital setting.

## RESULTS

The study examined the fetomaternal outcomes related to eclampsia and reviewed 83 cases. The average maternal age was 31.34 ± 6.643 years, with a gestation time of 37.29 ± 3.274 weeks. The average gravidity and parity were 1.16 ± 1.366 and 1.70 ± 0.462, respectively. The average BMI of the individuals was 26.08 ± 1.18 kg/m². Preeclampsia indicators were seen in 69 patients, accounting for 83.1% of the group, while the remaining 14 patients (16.9%) did not exhibit these signs.

Maternal outcomes showed that four patients (4.8%) had acute renal damage and five patients (6.0%) acquired pulmonary edema. Maternal mortality was reported in 6 cases, accounting for 7.2% of the study population.

Fetal outcomes revealed that intrauterine growth restriction (IUGR) occurred in 39 fetuses, accounting for 47.0% of cases, whereas 44 fetuses (53.0%) showed normal growth. Preterm birth was observed in 41 cases, accounting for 49.4%, while mature deliveries occurred in 42 cases (50.6%). Fetal mortality was documented in seven cases, accounting for 8.4%, whereas 76 fetuses (91.6%) survived. We observed that preterm birth was notably associated with gestation period < 37 weeks (P = 0.0001), while pulmonary edema was notably associated with parity > 3 (P = 0.01). Other fetomaternal outcomes did not show any notable association with age, gestation period, parity, gravidity, and BMI.

**Table 1: Descriptive statistics**

| Descriptive variables | Mean | Std. Deviation |
|---|---|---|
| Age (Years) | 31.34 | 6.643 |
| Gestation period (Weeks) | 35.95 | 2.85 |
| Gravidity | 1.16 | 1.366 |
| Parity | 1.70 | .462 |
| BMI (Kg/m2) | 25.78 | 1.37 |
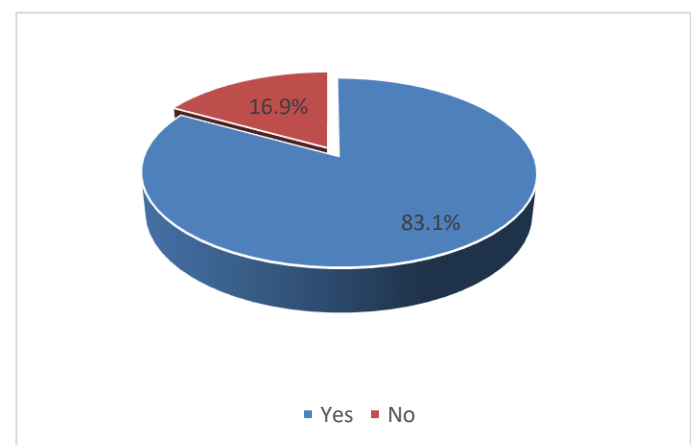


**Figure 1: Signs of preeclampsia**

**Table 2: Maternal outcomes**

| Maternal outcomes | | N | % |
|---|---|---|---|
| Acute kidney injury | Yes | 4 | 4.8% |
| | No | 79 | 95.2% |
| Pulmonary edema | Yes | 5 | 6.0% |
| | No | 78 | 94.0% |
| Maternal mortality | Yes | 6 | 7.2% |
| | No | 77 | 92.8% |

**Table 3: Fetal outcomes**

| Fetal outcomes | | N | % |
|---|---|---|---|
| IUGR | Yes | 39 | 47.0% |
| | No | 44 | 53.0% |
| Preterm birth | Yes | 41 | 49.4% |

| | | | |
|---|---|---|---|
| | No | 42 | 50.6% |
| Fetal mortality | Yes | 7 | 8.4% |
| | No | 76 | 91.6% |

## DISCUSSION

Our study's findings provide vital insights into the fetal and maternal outcomes of eclampsia, particularly in a secondary care hospital. Our study found that the average maternal age was 31.34 ± 6.643 years, consistent with Memon R et al.'s estimate of a mean age of 25-28 years among eclamptic patients (15). This minor variation could reflect regional demographic differences or disparities in community healthcare access. Priyanka P et al. reported a younger mean age of 22.7 years in their cohort, attributed to early marriages and pregnancies in specific socio-cultural circumstances (16). These disparities underscore the need for region-specific measures to address maternal health issues, particularly eclampsia prevention.

Our study's average gestational age at delivery was 35.95± 2.85 weeks, with preterm births occurring in 49.4% of cases. This finding is consistent with studies by Dixit P et al., where preterm deliveries accounted for 53% of cases, demonstrating the high risk of preterm birth associated with eclampsia (17). Similarly, Priyanka P et al. reported a preterm delivery rate of 25.76%, which is slightly lower but still significant in its implications for neonatal outcomes (16). The variation may result from differences in hospital protocols, access to antenatal care, and severity of eclampsia cases at the time of presentation.

The presence of preeclampsia signs was noted in 83.1% of our patients, which aligns with global patterns where hypertension and proteinuria are frequently observed in eclamptic patients. For instance, Priyanka P et al. reported significant levels of hypertension (91.5%) and proteinuria (80.5%) in their cohort (16). This indicates the critical role of timely antenatal screening for preeclampsia to mitigate progression to eclampsia.

Our investigation found maternal death in 7.2% of cases, which is consistent with previous findings. Dixit P et al. found a somewhat higher mortality rate of 7.65%, with cerebral hemorrhage being the primary cause of death (17) However, Priyanka P et al. found a higher maternal fatality rate of 18.50%, which was predominantly caused by acute pulmonary edema and disseminated intravascular coagulation (16). The decreased fatality rate in our study could be attributed to differences in the severity of the cases described or to better application of treatment procedures, such as using magnesium sulfate and prompt obstetric interventions. Nonetheless, mortality rates remain troubling, emphasizing the need for systemic improvements in maternal healthcare.

Fetal outcomes in our study indicated that intrauterine growth restriction (IUGR) occurred in 47% of cases, comparable to findings by Priyanka P et al., where IUGR was a significant fetal complication, albeit without a specific percentage being reported.16 Dixit P et al. reported a 72.44% rate of NICU admissions, reflecting the high burden of neonatal complications, including respiratory distress and prematurity (17). Similarly, Jido TA et al. observed that 39.1% of neonates had low Apgar scores, further underscoring the severe perinatal risks associated with eclampsia18. The fetal mortality rate in our study was 8.4%, which is lower than the 19.04% reported by Priyanka P et al. and the 11.22% observed by Dixit P et al. (16, 17). This discrepancy may arise from differences in neonatal care quality and availability across healthcare settings.

Maternal complications in our study included acute kidney injury (4.8%) and pulmonary edema (6.0%), which align with the findings of Memon R et al., who reported renal impairment in 8% of cases and pulmonary edema in 9%(15) Dixit P et al. documented a higher rate of acute kidney injury at 6.12% and a lower pulmonary edema rate of

1.53%(17). These variations likely stem from differences in case severity and baseline health conditions among patient populations.

## CONCLUSION

In conclusion, maternal outcomes demonstrated relatively lower rates of acute kidney injury and pulmonary edema, with maternal mortality at 7.2%. Fetal outcomes revealed considerable rates of preterm birth at 49.4% and intrauterine growth restriction in 47% of cases. Fetal mortality was recorded at 8.4%, highlighting the persistent risks associated with this condition despite medical interventions. Identifying and addressing avoidable factors such as delayed presentation and inadequate referral systems is essential to enhance the quality of care and reduce both maternal and fetal morbidity and mortality.

## DECLARATIONS

**Data Availability statement**
All data generated or analyzed during the study are included in the manuscript.
**Ethics approval and consent to participate**
Approved by the department Concerned. (IRBEC-LTC-024/24)
**Consent for publication**
Approved
**Funding**
Not applicable

## CONFLICT OF INTEREST

The authors declared absence of conflict of interest.

## AUTHOR CONTRIBUTION

***NAZISH HUSSAIN (Trainee Medical Officer)***
*Conception of Study, Data Collection, Data Entry, Development of Research Methodology Design, Study Design, Menuscript Review, and Review of Literature.*
***MUSARRAT JABEEN (Professor)***
*Critical Input, and final approval.*
***BEENISH SAMREEN HAMID (Assistant Professor)***
*Menuscript Review.*
***JALWA NARGIS (Medical Officer)***
*Menuscript Review*
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*Menuscript Review*

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