Original Article

Perinatal Outcomes in Pre-Eclampsia and Eclampsia Cases

Our Experience of Perinatal Outcomes in Pre-Eclampsia and Eclampsia Cases: A Clinical Study at a Tertiary Khairpur Medical College Hospital (KMCH) Sindh

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ABSTRACT

Objective: To evaluate the perinatal outcomes in pre-eclampsia and eclampsia cases and to investigate their association with the socio-demographic status of women at the Tertiary care hospital of Khairpur Medical College Hospital of Sindh.

Study Design: This hospital-based observational study.

Place and Duration of Study: This study was conducted at the Gynaecology Ward and Nursery of Khairpur Medical College Hospital (KMCH), Sindh, from July 2023 to June 2024.

Methods: In this study investigated the perinatal outcomes in cases of pre-eclampsia and eclampsia. Data was collected through patient interviews and neonatal assessments. Key maternal parameters recorded included age, parity, and gestational age at diagnosis. Neonatal outcomes were assessed based on birth weight, stillbirths, low birth weight, and intrauterine death.

Results: A total of 308 women who met the inclusion criteria were included in this study. The mean age of the women was 28.32±5.87 years. These 308 women gave live birth to 172 (55.8%) babies, and (40.3%) had stillbirths, whereas 12 (3.9%) had IUDs. The majority of live births (83, 48.3%) had a birth weight greater than 2.5 kg, whereas most stillbirths (69, 55.6%) and IUDs (5, 41.7%) had a birth weight between 2 and 2.5 kg.

Conclusion: Pre-eclampsia and eclampsia remain major problems in developing countries. They cause significant perinatal complications. Lack of education and awareness worsens outcomes, especially in low socio-economic groups. Perinatal mortality rates remain high. Expanding medical services to rural areas is crucial for better perinatal care.

Key Words: Eclempsia, Pre-eclempsia, Perinatal outcomes, Stillbirth, IUD

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INTRODUCTION

Hypertensive disorders of pregnancy, including pre-eclampsia and eclampsia, remain a significant cause of maternal and perinatal morbidity and mortality worldwide[1]. Pre-eclampsia, characterized by new-onset hypertension and proteinuria after 20 weeks of gestation, affects approximately 2–8%[2] of pregnancies, with a higher incidence in low-resource settings.

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Eclampsia, the severe manifestation of pre-eclampsia marked by seizures, contributes to a substantial proportion of maternal and neonatal deaths, particularly in regions with limited access to timely obstetric care[3]. The impact of these conditions extends beyond maternal health, significantly influencing fetal and neonatal outcomes, including preterm birth, intrauterine growth restriction (IUGR), and perinatal asphyxia[4].

The pathophysiology of pre-eclampsia and eclampsia is complex and not fully understood, but it primarily involves abnormal placentation, endothelial dysfunction, and an exaggerated maternal inflammatory response[5]. Impaired trophoblastic invasion leads to inadequate remodeling of the uteroplacental arteries, resulting in placental hypoperfusion and oxidative stress. This triggers the release of anti-angiogenic factors, such as soluble fms-like tyrosine kinase-1 (sFlt-1) [6] and endoglin, which disrupt endothelial function, leading to hypertension and multi-organ involvement. In eclampsia, cerebral vasospasm, endothelial injury, and ischemia contribute to the development of seizures, further complicating maternal and fetal outcomes[7].

The severity and timing of disease onset influence perinatal outcomes in pregnancies complicated by pre-eclampsia and eclampsia[8]. Early-onset pre-eclampsia, occurring before 34 weeks, is associated with higher rates of fetal complications, including IUGR, oligohydramnios, and stillbirth[9]. Late-onset pre-eclampsia, though generally less severe, can still lead to neonatal complications such as respiratory distress syndrome and neonatal intensive care unit (NICU) admissions[10].

Given the significant burden of perinatal complications associated with pre-eclampsia and eclampsia, this study aims to investigate perinatal outcomes in affected pregnancies[8]. By evaluating neonatal morbidity and mortality rates and identifying potential predictors of adverse outcomes, this research seeks to improve clinical management strategies and optimize neonatal care[11]. Understanding the patterns of perinatal complications in pre-eclampsia and eclampsia cases will contribute to the development of targeted interventions, ultimately improving maternal and neonatal health outcomes[12].

The primary and specific aims include examining the course of prenatal outcomes and evaluating connections between the occurrence of pre-eclampsia and eclampsia in postpartum moms with already existing risk factors identified. In this study context, we examine various antecedents that cause adverse fetal development, such as stillbirth, neonatal death, and neuro-developmental disability.

METHODS

This hospital-based observational study was conducted from July 2023 to June 2024, at the Gynaecology Ward and Nursery of Khairpur Medical College Hospital (KMCH), Sindh, to investigate perinatal outcomes in cases of pre-eclampsia and eclampsia. The study population included pregnant women diagnosed with pre-eclampsia, whether mild or severe, as well as those with eclampsia who were admitted to the Gynaecology Ward of KMCH. Neonatal outcomes were assessed in the Nursery.

The study's inclusion criteria comprised pregnant women diagnosed with pre-eclampsia or eclampsia, singleton pregnancies beyond 28 weeks of gestation, and patients who provided informed consent for participation. However, pregnancies complicated by pre-existing chronic hypertension, diabetes mellitus, renal disease, or autoimmune disorders were excluded. Additionally, multiple pregnancies and cases with incomplete medical records or lack of consent were not included in the study.

The institutional review board of KMCH granted ethical approval for the study. Before being included in the study, all participants provided written informed consent. Patient confidentiality was strictly maintained, and no identifiable information was disclosed.

Data was collected through patient interviews and neonatal assessments. Key maternal parameters recorded included age, parity, and gestational age at diagnosis. Neonatal outcomes were assessed based on birth weight, stillbirths, low birth weight, and intrauterine death.

For statistical analysis, data was processed using SPSS software version 24. Descriptive statistics were applied to summarize maternal and neonatal characteristics. Categorical variables were compared using the Chi-square test, while continuous variables were analyzed using t- tests as appropriate. A p-value of less than 0.05 was considered statistically significant.

RESULTS

A total of 308 women who met the inclusion criteria were included in this study. The mean age of the women was 28.32±5.87 years. These 308 women gave live birth to 172 (55.8%) babies, and (40.3%) had stillbirths, whereas 12 (3.9%) had IUDs. (Figure. I).

There was no statistically significant difference in gestational age among the three outcome groups (alive, stillbirth, and intrauterine death [IUD]), with mean gestational ages of 36.70±3.76 weeks, 34.15±4.11 weeks, and 35.75±4.26 weeks, respectively. The distribution of gestational age categories (<28 weeks, 28–34 weeks, and >34 weeks) also showed no significant association with outcomes. Similarly, education status was not significantly associated with perinatal outcomes, as 66.3% of mothers in the alive group, 65.3% in the stillbirth group, and 75.0% in the IUD group were educated. Occupational status also did not significantly differ, with homemakers comprising 74.4%, 74.2%, and 75.0% of the alive, stillbirth, and IUD groups, respectively. However, parity approached statistical significance, with primigravid women accounting for 59.3% of the alive group, 55.6% of the stillbirth group, and 91.7% of the IUD group.

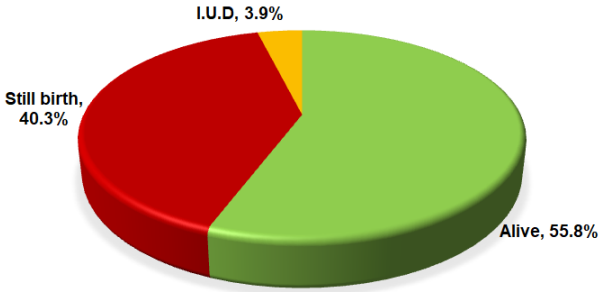

Figure No. 1: Distribution of outcome among the study patients

The mean birth weight was highest among live births (2.95±1.16 kg), followed by intrauterine demises (IUDs) (2.85±0.95 kg) and stillbirths (2.12±1.08 kilograms), with a statistically significant difference (p=0.004). The majority of live births (83, 48.3%) had a

birth weight greater than 2.5 kg, whereas most stillbirths (69, 55.6%) and IUDs (5, 41.7%) had a birth weight between 2 and 2.5 kg, though this difference was not statistically significant (p=0.607). Additionally, while live births and stillbirths were more commonly associated with grade 1 edema, IUDs predominantly exhibited grade 3 edema (7, 58.3%), with a significant association (p=0.002).

Table No. 1: Comparison between outcomes and baseline characteristics

Characteristics	Outcome			Test of sig.
	Alive	Still birth	I.U.D	
Gestational age (weeks)	36.70±3.76	34.15±4.11	35.75±4.26	F=0.74, d.f=2, p=0.480
<28 weeks	4 (2.3)	4 (3.2)	0 (0.0)	χ^2=1.86, d.f=4, p=0.761
28-34 weeks	39 (22.7)	35 (28.2)	3 (25.0)	
>34 weeks	129 (75.0)	85 (68.5)	9 (75.0)	
Education status				
Educated	114 (66.3)	81 (65.3)	9 (75.0)	χ^2=0.45, d.f=2, p=0.795
Non-educated	58 (33.7)	43 (34.7)	3 (25.0)	
Occupation				
Housewife	128 (74.4)	92 (74.2)	9 (75.0)	χ^2=0.05, d.f=2, p=0.998
Employed	44 (25.6)	32 (25.8)	3 (25.0)	
Parity				
Primi gravid	102 (59.3)	69 (55.6)	11 (91.7)	χ^2=5.88, d.f=2, p=0.053
Multigravida	70 (40.7)	55 (44.4)	1 (8.3)	
N (%) chi-square applied. Mean±S.D ANOVA applied.				

Table No .2: Comparison between outcomes and weight at birth & edema

Characteristics	Outcome			Test of sig.
	Alive	Still birth	I.U.D	
Weight at birth (kg)	2.95±1.16	2.12±1.08	2.85±0.95	F=8.69, d.f=2, p=0.004
<2 kg	31 (18.0)	21 (16.9)	1 (8.3)	χ^2=2.71, d.f=4, p=0.607
2-2.5 kg	58 (33.7)	69 (55.6)	6 (50.0)	
>2.5 kg	83 (48.3)	34 (27.4)	5 (41.7)	
Edema				
Grade 0	10 (5.8)	12 (9.7)	0 (0.0)	χ^2=24.02, d.f=8, p=0.002
Grade 1	98 (57.0)	74 (59.7)	5 (41.7)	
Grade 2	30 (17.4)	19 (15.3)	0 (0.0)	
Grade 3	25 (14.5)	12 (9.7)	7 (58.3)	
Grade 4	9 (5.2)	7 (5.6)	0 (0.0)	
N (%) chi-square applied. Mean±S.D ANOVA applied.				

DISCUSSION

The mean age of eclamptic women in our study was 28.32 ± 5.87 years, consistent with previous research findings. For instance, Lamminpää et al[13] reported a mean age of 26.6 ± 4.2 years among preeclamptic women under 35 years old. Similarly, Shahgheibi et al[14] found a mean age of 30.5 ± 6.6 years in women diagnosed with preeclampsia.

In your study, 59% of the 30 patients were primigravida, and 41% were multigravida. This distribution contrasts with findings from other studies. For instance, Okunade et al[15] reported primigravidae constituted only 15.3% of parturients in their research. Similarly, Amin et al[16] found that 54.83% of primigravida mothers were aged 21-30 years, while 65.75% of multigravida mothers were aged 31-40 years. These variations highlight differences in study populations and settings.

This study reports that 55.8% of births were live, 40.3% were stillbirths, and 3.9% were intrauterine deaths (IUDs), with mean gestational ages of 36.70 ± 3.76 weeks for live births, 34.15 ± 4.11 weeks for stillbirths, and 35.75 ± 4.26 weeks for IUDs. A population-based study by Gardosi et al[17] found that the median gestational age for stillbirths with fetal growth restriction was 32 weeks and three days, compared to 36 weeks and six days for those without growth restriction. This suggests that stillbirths often occur at earlier gestational ages, mainly when fetal growth restriction is present.

Additionally, a systematic review and meta-analysis by Muglu et al[18] reported that the prospective risk of

stillbirth increases with advancing gestational age, rising from 0.11 per 1,000 pregnancies at 37 weeks to 3.18 per 1,000 at 42 weeks. This indicates that while the risk of stillbirth is generally low at term, it escalates in post-term pregnancies.

This study found no significant association between maternal education and perinatal outcomes, with 66.3% of mothers in the alive group, 65.3% in the stillbirth group, and 75.0% in the intrauterine death (IUD) group being educated. Similarly, a study conducted by Karlsen et al[19] examining the relationship between maternal education and maternal mortality found that lower educational attainment was associated with an increased risk of adverse pregnancy outcomes.

In this study, among 308 women, 172 (55.8%) had live births, 124 (40.3%) experienced stillbirths, and 12 (3.9%) had intrauterine deaths (IUDs). These figures indicate a notably high stillbirth rate compared to global and regional statistics. Singhal et al[20] reported a high incidence of perinatal complications, with 71.43% of babies having low birth weight, 66% delivering preterm, 52.4% experiencing birth asphyxia, and 28.57% being stillborn. The study also found that maternal and perinatal outcomes were significantly poorer in cases of eclampsia compared to severe pre-eclampsia.

This study found that the mean birth weight of live births was significantly higher than stillbirths and intrauterine fetal demises (IUFDs). Specifically, live births had a mean weight of 2.95±1.16 kg, compared to 2.12±1.08 kg for stillbirths and 2.85±0.95 kg for IUFDs. Bukowski et al[21] emphasized that fetal growth restriction is a key contributor to stillbirth, often due to placental insufficiency. Similarly, a study by conducted by a researcher[22] demonstrated that small-for-gestational-age (SGA) fetuses have an increased risk of perinatal death, reinforcing the role of inadequate fetal growth in poor neonatal outcomes.

CONCLUSION

Pre-eclampsia and eclampsia remain major problems in developing countries. They cause significant perinatal complications. Lack of education and awareness worsens outcomes, especially in low socio-economic groups. Perinatal mortality rates remain high. Expanding medical services to rural areas is crucial for better perinatal care.

Author's Contribution:

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Final Approval of version:	All the above authors
Agreement to accountable for all aspects of work:	All the above authors

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