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Maternal Outcomes in Preeclamptic Patients Presenting to CMH, Abbottabad

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ABSTRACT

Objective: To determine the frequency of maternal outcomes in patients presenting with pre-eclampsia. **Research Design:** A descriptive study. **Duration and Place of Study:** This study was conducted at the Obstetrics and Gynecology Department, CMH Abbottabad, from August 2024 to February 2025. **Methodology:** A total of 180 women aged 18–40 years with singleton pregnancies beyond 20 weeks of gestation and diagnosed with preeclampsia (blood pressure ≥140/90 mmHg and proteinuria ≥300 mg/24 hours) were included. Women with a history of cardiac, renal, or neurological disorders were excluded. Maternal complications, including cesarean section, ICU admission, anemia, pulmonary edema, acute kidney injury, and HELLP syndrome, were documented. **Results:** The mean age of participants was 27.98 ± 3.02 years, mean gestational age was 32.66 ± 2.44 weeks, mean parity was 2.55 ± 1.24, and mean BMI was 24.58 ± 2.26 kg/m². Most patients belonged to low or middle socioeconomic status (92.2%) and urban areas (61.7%). Cesarean section was the most frequent maternal outcome (63.9%), followed by ICU admission (17.8%) and anemia (17.2%). Other complications included pulmonary edema (11.1%), acute kidney injury (8.9%), and HELLP syndrome (6.7%). **Conclusion:** Preeclampsia is associated with significant adverse maternal outcomes, particularly cesarean section and critical complications like ICU admissions.

INTRODUCTION

Preeclampsia is a pregnancy-related hypertensive disorder, presenting with features of hypertension and organ dysfunction, most often leading to significant maternal morbidity and mortality.[1] Amongst the serious consequences, the rates of C-section delivery are rather high among preeclamptic patients because of fetal distress, poor maternal health, and complications such as placental abruption.[3] Such surgical delivery carries further risks with regard to infection of the wound, hemorrhage, and longer recovery.[3] Management of preeclampsia often entails delivering early to prevent complications, thereby increasing the chances of C-sections further.[4]

Acute Kidney Injury (AKI) is another serious maternal complication related to preeclampsia.[5] In the pathophysiology, due to renal vasoconstriction, decreased perfusion of the kidney, in addition to endothelial injury, results in deteriorated renal function that at times can progress to states such as anuria or low urine output; in very serious conditions, this requires dialysis.[6] Admissions to the intensive care unit are common for both severe preeclampsia and its complications like pulmonary edema, which occurs from fluid overload and left ventricular dysfunction.[7] Pulmonary edema presents with respiratory distress and is thus considered an emergency which should first be stabilized with oxygen and diuretics.[8]

Preeclampsia is also associated with HELLP syndrome, a life-threatening condition that involves hemolysis, elevated liver enzymes, and low platelet count.[9] This is associated with a highly increased risk of maternal complications such as liver rupture or hemorrhage.[9] Patients with preeclampsia are also very commonly presenting low levels of Hb due to hemolysis or chronic blood loss, which further impairs fatigue and delays the recovery process.[10] Thus, early detection and timely intervention hold the key in the management of such complications to improve maternal outcome in preeclamptic patients.[11]

In a study by Khan B, et al. has shown that frequency of cesarean section was 63.4%, acute kidney injury

7.8%, admission in ICU 4.4%, pulmonary edema 6.6% and Low Hb levels was 18.9% in preeclamptic patients.[12]

Doing this study was especially important in the context of the Khyber Pakhtunkhwa (KPK) population, where limited healthcare resources and delayed access to care often complicate pregnancy. This study would provide critical insights into the prevalence of adverse outcomes such as cesarean sections, acute kidney injury, and HELLP syndrome, enabling targeted interventions in this high-risk group.

METHODOLOGY

This descriptive study was conducted at the Obstetrics and Gynecology Department, Combined Military Hospital (CMH), Abbottabad, from August 2024 to February 2025. This study included 180 women aged 18 to 40 years with singleton pregnancies, gestational age >20 weeks, and a diagnosis of preeclampsia, based on blood pressure ≥140/90 mmHg and proteinuria ≥300 mg/24 hours. Women with a history of cardiac disease, kidney failure, or neurological disorders were excluded. Informed consent was obtained from all participants.

During study period data collection involved a comprehensive initial assessment upon patient admission, which included obtaining a detailed medical history and performing a thorough abdominal examination to assess fetal size, presentation, and position. Blood pressure was measured using a calibrated sphygmomanometer, and proteinuria was tested through urine samples.

Patients were closely monitored for the development of maternal complications, which included cesarean section, acute kidney injury (defined by urine output <500 mL/day and serum creatinine >1.2 mg/dL), HELLP syndrome (diagnosed by elevated LDH >600 IU/L, bilirubin >1.2 mg/dL, liver transaminases >70 IU/L, and platelets <100,000/microL), ICU admission, pulmonary edema (indicated by PaO2 <60 mmHg, O2 saturation <90%, BNP >100 pg/mL), and low hemoglobin levels (<12 g/dL).

Data were analyzed using SPSS 26, with categorical variables expressed as frequencies and percentages, and quantitative variables summarized as mean ± SD or median (IQR) depending on the distribution.

RESULTS

The study included 180 patients with a mean age of 27.977±3.02 years, mean gestational age of 32.656±2.44 weeks, mean parity of 2.550±1.24, and mean BMI of 24.576±2.26 kg/m² (Table-I).

Table I

Mean±SD of patients according to age, gestational age, parity and BMI (n=180)

Demographics		Mean±SD
1	Age (years)	27.977±3.02
2	Gestational age (weeks)	32.656±2.44
3	Parity	2.550±1.24
4	BMI (Kg/m^2)	24.576±2.26

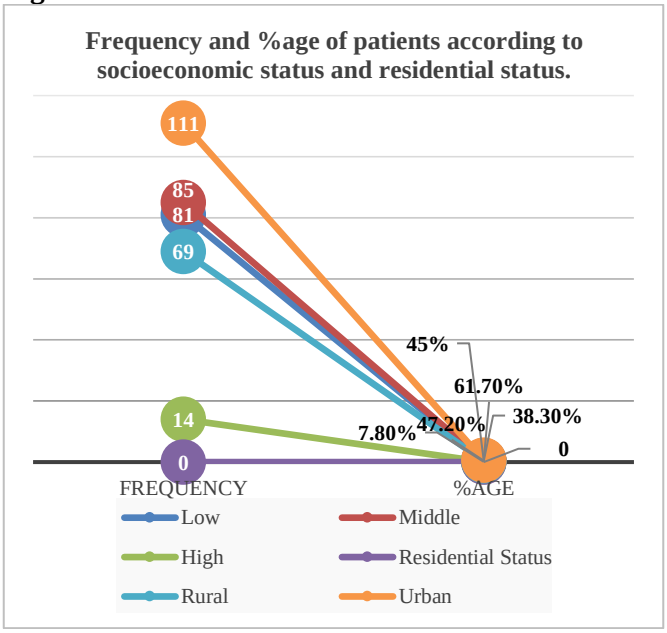
The socioeconomic distribution revealed that most patients belonged to either middle (47.2%, n=85) or low (45%, n=81) socioeconomic status, with only a small proportion from high socioeconomic status (7.8%, n=14). Regarding residential status, the majority of patients were from urban areas (61.7%, n=111) compared to rural areas (38.3%, n=69) (Table-II).

Table II

Frequency and %age of patients according to socioeconomic status and residential status.

Socioeconomic status	Frequency	%age
Low	81	45%
Middle	85	47.2%
High	14	7.8%
Residential Status	**Frequency**	**%age**
Rural	69	38.3%
Urban	111	61.7%

Figure 1



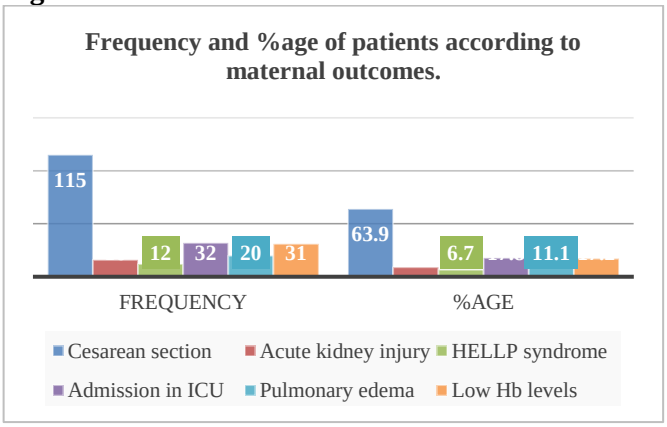
Various maternal outcomes were documented, with cesarean section being the most common (63.9%, n=115), followed by ICU admission (17.8%, n=32) and low hemoglobin levels (17.2%, n=31). Other complications included pulmonary edema (11.1%, n=20), acute kidney injury (8.9%, n=16), and HELLP syndrome (6.7%, n=12) (Table-III).

Table III

Frequency and %age of patients according to maternal outcomes.

Maternal outcomes	Frequency	%age
Cesarean section	115	63.9
Acute kidney injury	16	8.9
HELLP syndrome	12	6.7
Admission in ICU	32	17.8
Pulmonary edema	20	11.1
Low Hb levels	31	17.2

Figure 2



DISCUSSION

Maternal outcomes in preeclampsia are significant as they directly influence maternal health and survival during and after pregnancy.[13] Preeclampsia can lead to severe complications and early recognition and management of maternal outcomes are critical to preventing morbidity and mortality.[14] They also provide insights into healthcare system efficiency, guide intervention strategies, and improve overall maternal care in populations at risk.

Regarding demographic characteristics, our study population showed a higher mean age (27.977±3.02 years) compared to Dasari et al. [15] where the mean age was 23 years. This age difference could influence outcomes as both young and advanced maternal age affect pre-eclampsia severity. Our gestational age findings (32.656±2.44 weeks) aligned closely with Iftikhar et al. [16] (32.36±4.72 weeks) but differed from Siddique et al. [17] (34.11±3.88 weeks). Socioeconomic status played a significant role in our study, with predominantly low (45%) and middle (47.2%) socioeconomic backgrounds. This aligns with Dixit et al. [18] who emphasized poor outcomes associated with socioeconomic factors affecting access to care. Our urban predominance (61.7%) contrasts with Dasari et al. [15] whose study focused on rural populations where healthcare access challenges were more pronounced. Regarding complications, our findings showed some notable variations. While HELLP syndrome was the most frequent complication in both Iftikhar et al. [16] (19%) and Siddique et al. [17] (21%), our study found a lower prevalence (6.7%). Our higher rate of acute kidney injury (8.9%) compared to Iftikhar et al. [17] (1%) and Siddique et al. [18] (3%) suggests more severe cases in our cohort. Our cesarean section rate (63.9%) and ICU admission rate (17.8%) indicate significant disease severity, aligning with Bozdağ et al. [19] and Dixit et al. [18] who emphasized the importance of ICU facilities in managing severe cases. The presence of anemia (17.2%) in our study was lower than Malhan et al. [20] (44.1%), though higher than baseline populations in most studies.

Our study findings highlight the critical need for early detection, effective management, and prompt referral in cases of preeclampsia to mitigate adverse maternal and perinatal outcomes. Strengthening antenatal care systems and ensuring access to comprehensive obstetric care, particularly in resource-limited settings, can significantly reduce complications and mortality.

CONCLUSION

Our study has concluded that pre-eclampsia frequently leads to adverse maternal outcomes, with cesarean section being the most common. Complications such as ICU admissions, anemia, pulmonary edema, and HELLP syndrome emphasize the need for timely diagnosis and effective management to improve maternal health outcomes.

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