Biological and Clinical Sciences Research Journal
eISSN: 2708-2261; pISSN: 2958-4728
www.bcsrj.com
DOI: https://doi.org/10.54112/bcsrj.v6i4.2276
*Biol. Clin. Sci. Res. J., Volume 6(4), **2025**: 2276*
Original Research Article

Maternal Outcome in Pregnant Women Presenting with Preeclampsia

Kiran Safeer*, Saima Gilani

Department of Obstetrics and Gynaecology, Rehman Medical Institute, Peshawar, Pakistan
**Corresponding author`s email address:* kiransafeer@hotmail.com

(Received, 7th January 2025, Accepted 8th April 2025, Published 30th April 2025)

Abstract: *Preeclampsia is a major hypertensive disorder of pregnancy and remains an important contributor to maternal morbidity, particularly after 20 weeks of gestation. Early identification of maternal complications is essential to guide timely obstetric management.* ***Objective:*** *To determine the maternal outcome in pregnant women presenting with preeclampsia.* ***Methodology:*** *A descriptive study was conducted on 143 patients aged 18 to 40 years with gestational age > 20 weeks who presented with preeclampsia, enrolled via a non-probability, consecutive sampling technique from 05-July-2024 to 05-January-2025 in the Obstetrics & Gynecology department, Rehman Medical Institute, Peshawar. Patients with cardiovascular disease, chronic renal failure, and those who had recent abdominal surgery were excluded. Maternal outcomes were assessed, such as HELLP syndrome, placental abruption and acute renal failure. Data were analyzed using SPSS 23. Chi-square or Fisher's exact test was used for stratified analyses, with p-values ≤ 0.05 considered significant.* ***Results:*** *The mean age of 143 patients in this study was 28.29±6.28 years, and their mean gestational age was 32.32±5.37 weeks. HELLP syndrome was observed in 19 (13.3%) cases, placental abruption in 11 (7.7%) cases, and acute renal failure in 7 (4.9%) cases. The majority of women were from lower socioeconomic classes (42.7%), illiterate (61.5%), and unemployed (65.7%). Stratification analysis revealed no significant association of maternal outcomes with demographics (p > 0.05 for all).* ***Conclusion:*** *In pregnant women presenting with preeclampsia, the prevalence of HELLP syndrome was 13.3%, placental abruption was 7.7%, and acute renal failure was 4.9%.*

Keywords: Preeclampsia, HELLP syndrome, placental abruption, acute renal failure, maternal outcomes

[***How to Cite:*** Safeer K, Gilani S. Maternal Outcome In Pregnant Women Presenting With Preeclampsia. *Biol. Clin. Sci. Res. J.*, **2025;** 6(4): 283-286. doi: https://doi.org/10.54112/bcsrj.v6i4.2276

Introduction

Pre-eclampsia is a multifaceted and potentially severe condition during pregnancy that is distinguished by elevated blood pressure (hypertension) and indications of impairment to many organ systems, predominantly the liver and kidneys (1). This issue commonly manifests itself after the 20th week of gestation and has the potential to result in severe consequences for both the maternal and fetal health if not promptly addressed (2). Pre-eclampsia is a prominent contributor to illness and death among mothers and newborns worldwide, thereby attracting considerable attention in the fields of obstetrics and maternal-fetal medicine (3).

A study performed on pregnant women, in which (4.2%) developed pre-eclampsia, with (0.4%) being early-onset pre-eclampsia. Women with pre-eclampsia had a lower subsequent birth rate (57.4%) compared with women without pre-eclampsia (61.2%), and it was considerably lower in women with early-onset pre-eclampsia (49.4%). Among women with pre-eclampsia who had a subsequent birth, the overall pre-eclampsia rate was 15.8%, and higher in those with early-onset pre-eclampsia (31.5%) (4).

The etiology of pre-eclampsia remains uncertain; however, multiple factors are postulated to play a role in its pathogenesis. An influential hypothesis concerns irregularities in the placenta, the organ that provides nourishment and support to the fetus throughout pregnancy (5). Pre-eclampsia is characterized by insufficient formation of blood vessels in the placenta, which can reduce blood flow and oxygen supply to the fetus (6).

Maternal outcomes in women with preeclampsia encompass a spectrum of clinical manifestations and complications. Hypertension, a hallmark feature of preeclampsia, can lead to various cardiovascular complications such as myocardial infarction, heart failure, and stroke (7, 8). Renal involvement is another significant aspect of preeclampsia-related maternal outcomes. The development of renal insufficiency, proteinuria, and electrolyte imbalances underscores the impact of preeclampsia on renal function. Monitoring renal parameters and managing fluid and electrolyte balance are essential components of the care of pregnant women with preeclampsia to mitigate renal complications (9). A study reported the maternal outcome in women with preeclampsia, i.e., HELLP syndrome (21%), placental abruption (16%), and acute renal failure (3%) (10).

Due to the paucity of literature on this subject locally, the goal of this study is to determine the maternal outcome among pregnant women presenting with preeclampsia at our health setup. The findings of this study will help our health professionals shed light on the measures that are crucial for enhancing maternal outcomes and safeguarding the welfare of both mothers and infants. The results of this study will encourage early recognition, timely intervention, and multidisciplinary management, key strategies to optimize maternal outcomes and reduce the burden of preeclampsia-related complications.

Methodology

The present study was conducted from 05 July 2024 to 05 January 2025 in the Obstetrics & Gynecology department, Rehman Medical Institute, Peshawar, as a descriptive study. Ethical approval was obtained from the hospital's Research Ethics Committee (RMI-REC/Ethical Approvals/CPSP Synopsis/54). A sample of 143 patients was selected for this study using the WHO sample size calculator, keeping the following parameters: taking acute renal failure (3%) (10) as a maternal outcome of pre-eclampsia. Margin of error 2.8%, and Confidence level 95%. Patients were enrolled in the study using non-probability consecutive sampling.

Pregnant women aged 18 to 40 years with gestational age > 20 weeks, presenting with preeclampsia, were included. Preeclampsia was defined as patients presenting with severe headaches, blurred eyesight, and vomiting. Diagnosis was made by checking blood pressure levels showing systolic blood pressure (SBP) ≥140 mmHg AND/OR diastolic blood pressure (DBP) ≥ 90 mmHg on a sphygmomanometer after 20 weeks of gestation, along with proteinuria > 300mg within 24 hours on

urine sampling. Patients with cardiovascular disease, chronic renal failure and a recent history of abdominal surgery were excluded.

The study's goals and benefits were explained to enrolled patients. Written informed consent was taken. Baseline demographics such as age, BMI, educational status, occupation status, socioeconomic status, and residence were recorded. All patients with preeclampsia were evaluated for maternal outcome, such as HELLP syndrome (patients presenting with all of the following. Fatigue, abdominal pain (VAS >3), and headaches. Diagnosis was made by conducting a blood test showing all of the following: Elevated serum lactate dehydrogenase (LDH) levels> 600 IU/L, Serum aspartate aminotransferase (AST) levels > 70 IU/L, and Platelet count <100,000/microliter, placental abruption (patients presenting with all of the following: Abdominal pain (VAS>4), vaginal bleeding. Diagnosis was achieved on ultrasound assessment showing all of the following: Placental thickness >5cm, intra-amniotic hematoma, and acute renal failure (patients presenting with all of the following: Decreased urine output, fluid retention, and fatigue. Diagnosis was established by a blood test showing an increase in serum creatinine level by ≥ 0.3 mg/dL within 48 hours. This entire evaluation was performed under the guidance of a consultant with at least five years of post-fellowship experience.

SPSS version 23 was used to analyze the data. Frequencies and percentages were calculated for categorical data, including maternal outcomes (HELLP syndrome, placental abruption, and acute renal failure), education status, occupation status, socioeconomic status, and residence. Mean + SD were calculated for numerical data like age, gestational age, height, weight, and BMI. Maternal outcomes were stratified by age, gestational age, BMI, education status, occupation status, socioeconomic status, and residence. Post-stratification Chi-square or Fisher's exact test was applied by keeping the p-value < 0.05 as significant. Results were shown as tables.

Results

A total of 143 women with preeclampsia were enrolled in the current study. The mean age of the women was 28.29±6.28 years. The mean gestational age was 32.32±5.37 weeks. The mean body mass index of the women was 27.42 ± 3.04 kg/m².

Regarding socioeconomic distribution, 61 women (42.7%) were from the lower class, 59 women (41.3%) were from the middle class, and 23 women (16.1%) were from the lower class. The rest of the distribution regarding education, residence and occupation is presented in table no 1.

The maternal outcomes observed in this cohort were HELLP syndrome, which was encountered by 19 cases (13.3%), while 124 women (86.7%) did not have this complication. Placental abruption was observed in 11 patients (7.7%), while 132 women (92.3%) had no placental separation. Acute renal failure was diagnosed in 7 women (4.9%), while 136 patients (95.1%) did not have renal impairment (Table 2). Stratification was performed across Tables 3 to 5 to assess the association between maternal outcomes and demographic and clinical variables. The results showed that HELLP syndrome, placental abruption, and acute renal failure were more frequent in certain subgroups; however, no statistically significant association was observed, as all p-values were greater than 0.05.

Table 1: Demographics

Demographics		**(n)**	**%**
Socioeconomic status	Lower class	61	42.7%
	Middle class	59	41.3%
	Upper class	23	16.1%
Education status	Literate	55	38.5%
	Illiterate	88	61.5%
Residence	Urban	78	54.5%
	Rural	65	45.5%
Occupation status	Employed	49	34.3%
	Unemployed	94	65.7%

Table 2: Maternal outcomes

		(n)	**%**
HELLP syndrome	Yes	19	13.3%
	No	124	86.7%
Placental abruption	Yes	11	7.7%
	No	132	92.3%
Acute renal failure	Yes	7	4.9%
	No	136	95.1%

Table 3: Stratification of HELLP syndrome with demographics

Demographics		**HELLP syndrome**				**p value**
		Yes		**No**		
		(n)	**%**	**(n)**	**%**	
Age groups (Years)	18 to 30	12	63.2%	84	67.7%	0.692
	31 to 40	7	36.8%	40	32.3%	
Gestational age (Weeks)	21 to 33	12	63.2%	68	54.8%	0.469
	> 33	7	36.8%	56	45.2%	
BMI (Kg/m2)	18.5 to 25	6	31.6%	48	38.7%	0.550
	> 25	13	68.4%	76	61.3%	
Socioeconomic status	Lower class	6	31.6%	55	44.4%	0.284
	Middle class	11	57.9%	48	38.7%	
	Upper class	2	10.5%	21	16.9%	
Education status	Literate	7	36.8%	48	38.7%	0.876
	Illiterate	12	63.2%	76	61.3%	
Residence	Urban	11	57.9%	67	54.0%	0.753

	Rural	8	42.1%	57	46.0%	
Occupation status	Employed	10	52.6%	39	31.5%	0.070
	Unemployed	9	47.4%	85	68.5%	

Table 4: Stratification of Placental abruption with demographics

Demographics		**Placental abruption**				**p value**
		Yes		**No**		
		(n)	**%**	**(n)**	**%**	
Age groups (Years)	18 to 30	5	45.5%	91	68.9%	0.111
	31 to 40	6	54.5%	41	31.1%	
Gestational age (Weeks)	21 to 33	7	63.6%	73	55.3%	0.593
	> 33	4	36.4%	59	44.7%	
BMI (Kg/m2)	18.5 to 25	5	45.5%	49	37.1%	0.584
	> 25	6	54.5%	83	62.9%	
Socioeconomic status	Lower class	5	45.5%	56	42.4%	0.805
	Middle class	5	45.5%	54	40.9%	
	Upper class	1	9.1%	22	16.7%	
Education status	Literate	4	36.4%	51	38.6%	0.882
	Illiterate	7	63.6%	81	61.4%	
Residence	Urban	7	63.6%	71	53.8%	0.529
	Rural	4	36.4%	61	46.2%	
Occupation status	Employed	4	36.4%	45	34.1%	0.879
	Unemployed	7	63.6%	87	65.9%	

Table 5: Stratification of Acute renal failure with demographics

Demographics		**Acute renal failure**				**p value**
		Yes		**No**		
		(n)	**%**	**(n)**	**%**	
Age groups (Years)	18 to 30	3	42.9%	93	68.4%	0.161
	31 to 40	4	57.1%	43	31.6%	
Gestational age (Weeks)	21 to 33	5	71.4%	75	55.1%	0.397
	> 33	2	28.6%	61	44.9%	
BMI (Kg/m2)	18.5 to 25	1	14.3%	53	39.0%	0.189
	> 25	6	85.7%	83	61.0%	
Socioeconomic status	Lower class	4	57.1%	57	41.9%	0.717
	Middle class	2	28.6%	57	41.9%	
	Upper class	1	14.3%	22	16.2%	
Education status	Literate	2	28.6%	53	39.0%	0.581
	Illiterate	5	71.4%	83	61.0%	
Residence	Urban	3	42.9%	75	55.1%	0.524
	Rural	4	57.1%	61	44.9%	
Occupation status	Employed	1	14.3%	48	35.3%	0.253
	Unemployed	6	85.7%	88	64.7%	

Discussion

Hypertensive disorders of pregnancy, especially preeclampsia, continue to represent a significant health burden due to their strong association with adverse maternal and neonatal outcomes. The existing literature demonstrates that preeclampsia leads to significantly higher rates of maternal complications. Tabassum et al. reported a preeclampsia rate of 1.95% in their study with maternal complications including HELLP syndrome in 3.5% cases, placental abruption in 3.5% and acute renal failure in 1.4% cases. The mean maternal age in their study was 32.27±6.42 years, and the mean gestational age at diagnosis was 35.61±3.69 weeks. The study observed that adverse pregnancy outcomes were significantly more common among women with preeclampsia, and they highlighted the importance of a regular goal-oriented clinical audit combined with a multidisciplinary approach to improve clinical outcomes. (11)

Similar findings have been noted from studies conducted in low-resource settings where the burden of preeclampsia-related morbidity tends to be higher. Belay Tolu et al. conducted a study in urban Ethiopia and found that 31.7% of women with preeclampsia developed maternal complications, with 19.5% progressing to severe preeclampsia. The perinatal mortality rate in that study was 4.26%. The study concluded that expectant outpatient management with once-weekly visits was inadequate in settings where home-based self-care remains poor, and they called for special consideration and close surveillance of women presenting early-onset of the disease. (12)

In another study conducted by Melesse et al., it was reported that 37.7% of women admitted with severe preeclampsia or eclampsia experienced adverse maternal outcomes, with HELLP syndrome developing in 39.5% of those with unfavourable outcomes, acute renal failure in 55.2% and placental abruption in 27.3%. Significant associated factors included educational status, rural residence, low monthly family income, nulliparity, history of abortion, unbooked status and delayed administration of antihypertensive or magnesium sulphate therapy. (13)

Vennela et al. in their study reported HELLP syndrome frequency of 15%, placental abruption in 14% and acute renal failure in 9% among 100 women with severe preeclampsia and eclampsia. The majority of patients in the aforementioned study were in the 20-28 years age group, and 65% delivered before 37 weeks of gestation. (14) Malhan et al. reported a lower preeclampsia frequency of 14.4% among 340 pregnant women with a

mean maternal age of 28.3±3.5 years and a mean gestational age of 33.6±5.2 weeks. In that cohort, preeclampsia was significantly more common among women with diabetes mellitus, anaemia and those with a history of smoking, highlighting the multifactorial nature of this condition.

The maternal outcomes observed in the present study showed that HELLP syndrome occurred in 19 (13.3%) cases. This figure is comparable to the 14.9% reported by Melesse et al and 15% reported by Vennela et al.(13,14) Placental abruption occurred in 11 patients (7.7%) which is similar to the 5.4% observed by Belay Tolu et al.(12) Acute renal failure occurred in 7 (4.9%) cases which is comparable to the 3% reported by Siddique et al. but lower than the 55.2% reported by Melesse et al.(10,13) Several factors may explain the variation in complication rates across different studies. The strengths of the present study include the prospective nature of data collection and the detailed characterization of sociodemographic variables, including socioeconomic status and education level, which are often underreported in preeclampsia research in similar settings. The present study provided region-specific data on maternal outcomes that can inform local clinical protocols and health policy decisions. However, several limitations must be acknowledged. The single-centre design limits the generalisability of the findings to other hospitals with different patient populations or resource availability. The absence of a normotensive control group means that the excess risk attributable to preeclampsia cannot be directly quantified from the present data. Long-term follow-up of these women to assess the persistence of renal dysfunction or future cardiovascular risk was not performed and represents an area for future investigation.

Conclusion

In conclusion, the present study demonstrated that in pregnant women presenting with preeclampsia, the prevalence of HELLP syndrome was 13.3%, placental abruption was 7.7%, and acute renal failure was 4.9%. Early recognition of preeclampsia and prompt referral to tertiary care facilities remain essential strategies for reducing the burden of maternal complications associated with this condition.

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. (RMI-REC/Ethical Approvals/CPSP Synopsis/54)

Consent for publication
Approved

Funding
Not applicable

Conflict of interest

The authors declared no conflict of interest.

Author Contribution

KS (Postgraduate Resident)
Data Collection, Data Analysis and Manuscript drafting
SG (Professor)
Critical guidance and final approval of the draft.

All authors reviewed the results and approved the final version of the manuscript. They are also accountable for the integrity of the study.

References

1. Dimitriadis E, Rolnik DL, Zhou W, Estrada-Gutierrez G, Koga K, Francisco RPV, et al. Pre-eclampsia. Nat Rev Dis Primers. 2023;9(1):8. https://doi.org/10.1038/s41572-023-00417-6
2. Chappell LC, Cluver CA, Kingdom J, Tong S. Pre-eclampsia. Lancet. 2021;398(10297):341-354. https://doi.org/10.1016/S0140-6736(20)32335-7
3. Burton GJ, Redman CW, Roberts JM, Moffett A. Pre-eclampsia: pathophysiology and clinical implications. BMJ. 2019;366:l2381. https://doi.org/10.1136/bmj.l2381
4. Havers-Borgersen E, Fosbol E, Johansen M, Kober L, Morris JM, Seeho SKM. Pre-eclampsia in a first pregnancy and subsequent pregnancy outcomes: a nationwide cohort study. J Epidemiol Community Health. 2023;77(11):694-703. https://doi.org/10.1136/jech-2023-220829
5. Phipps EA, Thadhani R, Benzing T, Karumanchi SA. Pre-eclampsia: pathogenesis, novel diagnostics and therapies. Nat Rev Nephrol. 2019;15(5):275-289. https://doi.org/10.1038/s41581-019-0119-6
6. Giannakou K. Prediction of pre-eclampsia. Obstet Med. 2021;14(4):220-224. https://doi.org/10.1177/1753495X20984015
7. Omani-Samani R, Ranjbaran M, Amini P, Esmailzadeh A, Sepidarkish M, Almasi-Hashiani A. Adverse maternal and neonatal outcomes in women with preeclampsia in Iran. J Matern Fetal Neonatal Med. 2019;32(2):212-216. https://doi.org/10.1080/14767058.2017.1376643
8. Venkatesh KK, Strauss RA, Westreich DJ, Thorp JM, Stamilio DM, Grantz KL. Adverse maternal and neonatal outcomes among women with preeclampsia with severe features <34 weeks gestation with versus without comorbidity. Pregnancy Hypertens. 2020;20:75-82. https://doi.org/10.1016/j.preghy.2020.03.006
9. da Silva WA, Pinheiro AM, Lima PH, Malbouisson LMS. Renal and cardiovascular repercussions in preeclampsia and their impact on fluid management: a literature review. Braz J Anesthesiol. 2021;71(4):421-428. https://doi.org/10.1016/j.bjane.2021.02.052
10. Siddique U, Naeem SK, Ramejo BB, Rizwan AS, Imran M, Sahito N. Maternal outcome in women with preeclampsia. Pak J Med Health Sci. 2021;15(7):1769-1771. https://doi.org/10.53350/pjmhs211571769
11. Tabassum S, AlSada A, Bahzad N, Sulaibeekh N, Qureshi A, Dayoub N. Preeclampsia and its maternal and perinatal outcomes in pregnant women managed in Bahrain's tertiary care hospital. Cureus. 2022;14(5):e24637. https://doi.org/10.7759/cureus.24637
12. Belay Tolu L, Yigezu E, Urgie T, Feyissa GT. Maternal and perinatal outcome of preeclampsia without severe feature among pregnant women managed at a tertiary referral hospital in urban Ethiopia. PLoS One. 2020;15(4):e0230638. https://doi.org/10.1371/journal.pone.0230638
13. Melesse MF, Aynalem GL, Badi MB, Aynalem BY. Maternal outcomes of severe preeclampsia and eclampsia and associated factors among women admitted at referral hospitals of Amhara regional state, institutional-based cross-sectional study, North-West Ethiopia. Front Glob Womens Health. 2025;6:1555778. https://doi.org/10.3389/fgwh.2025.1555778
14. Vennela M, Yeddala M, Lakshmipriya Y, Latha G. A study of maternal and perinatal outcome in severe preeclampsia and eclampsia in a tertiary care hospital. Eur J Cardiovasc Med. 2025;15(4):18-24. https://doi.org/10.5083/ejcm/25-04-04
15. Malhan A, Hyder M, Baloch S, Zahegul, Roshan S, Dembra G, et al. Frequency of preeclampsia in pregnant women presenting in a tertiary hospital. Pak J Health Sci. 2023;4(4):30-33. https://doi.org/10.54393/pjhs.v4i04.652