

COMPARISON OF THE MATERNAL OUTCOME OF PREECLAMPTIC PATIENTS IN BOOKED VERSUS UNBOOKED CASES AT TERTIARY CARE HOSPITAL, KARACHI

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Abstract

Background: Antenatal care helps identify and manage risks during pregnancy, yet some women still reach delivery without prior care. This study examined maternal outcomes among women with preeclampsia and compared complications between those who were booked and unbooked at a tertiary care hospital.

Methods: We conducted a cross-sectional study of 157 women diagnosed with preeclampsia. We collected demographic and obstetric data and assessed maternal outcomes, including postpartum hemorrhage, placental abruption, and acute renal failure. We compared these outcomes by booking status using standard statistical tests, with significance set at $p < 0.05$.

Results: Most women were aged 20–35 years, lived in urban areas, and had received antenatal care. Overall complication rates were low. Postpartum hemorrhage occurred in a small proportion and did not show strong associations, although it was more frequent among unbooked women. Placental abruption was significantly higher among rural and unbooked patients. Acute renal failure was rare but occurred only in unbooked women.

Conclusion: Maternal complications were uncommon overall, but women without antenatal care faced higher risks, particularly for more severe outcomes. Improving early use of antenatal services, especially in underserved groups, may help reduce preventable complications.

INTRODUCTION

In Pakistan, complications related to pregnancy and childbirth claim the lives of three women every hour. Among these, hypertensive disorders during pregnancy affect approximately 6% to 8% of all expectant mothers.¹ Hypertensive disorders in pregnancy are recognized as a major contributor to poor maternal and fetal outcomes worldwide, with a particularly greater impact in low- and middle-income countries.² Hypertensive disorders during pregnancy encompass a range of

conditions, from mild increases in blood pressure to severe forms involving dysfunction of multiple organ systems.³ Institutions like the American College of Obstetricians and Gynecologists (ACOG) and the United Nations have categorized hypertensive disorders associated with pregnancy into four distinct types: chronic hypertension, gestational hypertension (also known as pregnancy-induced hypertension), preeclampsia/eclampsia, and preeclampsia/eclampsia superimposed on chronic

hypertension.⁴ Hypertension accompanied by proteinuria, diagnosed as preeclampsia, typically develops after the 20th week of pregnancy and affects approximately 2% to 8% of all pregnancies.

⁵ Hypertensive emergencies during pregnancy can manifest as HELLP syndrome (characterized by hemolysis, elevated liver enzymes, and low platelet count) or as eclampsia, which involves seizures in a patient with preeclampsia. Following obstetric hemorrhage, preeclampsia and eclampsia are among the leading contributors to maternal and perinatal illness and death.⁶⁻⁷

Antenatal care is especially important as it reflects a woman's access to appropriate healthcare services. Early and regular consultations with healthcare professionals play a crucial role in detecting and managing potential complications during pregnancy and childbirth effectively.⁸ Antenatal care, which refers to the medical attention provided throughout pregnancy until the onset of labor and delivery, has been in practice for over a century. It is considered one of the most essential components of healthcare services, and its importance and acceptance continue to grow steadily among populations worldwide.⁹ The primary goal of antenatal care is to safeguard and enhance the health of both the mother and the developing fetus. Preeclampsia, which affects approximately 3% to 5% of all pregnancies, is marked by abnormalities in placental and maternal blood vessel function. This condition can result in a range of serious complications, including dangerously high blood pressure, stroke, eclampsia (seizures), and damage to vital maternal organs such as the kidneys and liver. It may also lead to bleeding events like placental abruption or postpartum hemorrhage, restricted fetal growth within the womb, and, in severe cases, the death of the mother or fetus.¹⁰ A study found prevalence of preeclampsia to be 25% and maternal outcome in these patients to be (postpartum hemorrhage 29%, placental abruption 31.6% and acute renal failure 28.5%).¹¹ An early antenatal visit to a health care facility has many benefits, including accurate dating by LMP and ultrasound, early recognition of high-risk pregnancies and detection of pregnancy complication like gestational diabetes, pregnancy

induced hypertension and pre-eclampsia by objective assessment of maternal baselines weight, blood pressure and urine analysis. The obstetric and perinatal outcomes can be improved by early booking, good antenatal care and delivery by trained persons. The non-utilization of antenatal and delivery care services leads to maternal complications and poor antenatal outcomes. Data from this study would help us in addressing this problem as there is paucity of local data.

MATERIAL AND METHODS

Following approval from the **College of Physicians and Surgeons Pakistan**, this cross-sectional study will be carried out over a six-month period from **September 2024 to March 2025** at the Department of Gynecology and Obstetrics, Abbasi Shaheed Hospital, Karachi. A total of 157 patients will be enrolled based on a prevalence estimate of PPH at 27.6%,¹¹ a 7% margin of error, and a 95% confidence level. The sample size was calculated using WHO statistical software, and participants will be selected using a non-probability consecutive sampling method.

Eligible participants will include pregnant women aged 20 to 45 years who present with a history of preeclampsia, have a singleton pregnancy in cephalic presentation as confirmed on ultrasound, and are at least gravida 1. Patients will be excluded if they have a history of thyroid disorders, autoimmune diseases, connective tissue disorders, vasculitis, or other chronic medical conditions such as diabetes mellitus, cardiac disease, epilepsy, renal disease, or respiratory illnesses.

After obtaining informed consent, demographic data and booking status will be recorded through patient interviews. Booking status will be determined based on antenatal care history, including at least three antenatal visits, one dose of tetanus immunization, and a minimum of two visits within the final two weeks before delivery. Each patient meeting the inclusion criteria will be monitored for maternal outcomes, including postpartum hemorrhage, placental abruption, and acute renal failure, using the criteria outlined in the study's operational definitions. All relevant data will be recorded in a structured performa developed for this purpose.

Data will be analyzed using SPSS version 20. For quantitative variables such as maternal age and gestational age, mean and standard deviation will be computed if the data follows a normal distribution; otherwise, median and interquartile ranges will be reported. Categorical variables such as residence, booking status, parity, gravida, family income, occupation, and maternal outcomes will be presented as frequencies and percentages. The maternal outcomes between booked and unbooked cases will be compared using the Chi-square test, with a p -value ≤ 0.05 considered statistically significant. Stratification will be used to control for potential effect modifiers, including maternal age, residence, parity, gravida, income, occupation, and gestational age. Post-stratification analyses will involve Chi-square or Fisher's exact test, as appropriate, to evaluate the influence of these factors on the maternal outcomes.

RESULTS

The study included 157 women, most of whom were aged 20–35 years. The majority presented at or before 39 weeks of gestation and lived in urban areas. About two-thirds had received antenatal care, while one-third remained unbooked. Gravidity was evenly distributed, though most women had lower parity (≤ 3). A large proportion belonged to lower-income households, and most were employed. Overall, maternal complications were relatively infrequent, with postpartum hemorrhage, placental abruption, and acute renal failure occurring in small proportions of the cohort. This pattern suggests that a considerable share of women had some level of access to care, which may have helped limit severe outcomes.

Postpartum hemorrhage occurred in a small number of cases, and none of the examined factors showed a statistically significant association. Still, some patterns emerged. Women who had not booked antenatal care experienced higher rates of hemorrhage compared to those who had. Similarly, women with higher parity and gravidity showed a slightly increased risk. Although these differences did not reach significance, they point toward a clinically relevant trend where limited monitoring during pregnancy may leave underlying risks unaddressed.

Placental abruption showed a clearer pattern. Women from rural areas experienced a notably higher proportion of abruption compared to those from urban settings, and this difference was statistically significant. Unbooked women also had a higher rate of abruption than booked women. These findings suggest that reduced access to timely antenatal care and delayed identification of complications may contribute to adverse placental outcomes. Other factors, such as parity and income, did not show strong associations, although women with lower income appeared to carry a slightly higher risk.

Acute renal failure was rare but showed a distinct distribution. All cases occurred among unbooked women, and this association reached statistical significance. This pattern highlights how delays in care can allow complications to progress to more severe stages. Even though the number of cases was small, the clustering among unbooked women reinforces the role of early monitoring in preventing end-organ damage.

Overall, the results point in a consistent direction. Women who did not receive antenatal care, as well as those from rural or lower-income backgrounds, tended to experience more complications. While the overall rates remained low, the differences across groups suggest that gaps in access and utilization still influence maternal outcomes. Improving early engagement with antenatal services, particularly for underserved populations, could help reduce these risks further.

DISCUSSION

The findings of this study point to a relatively low burden of maternal complications, which likely reflects better access to care and a higher proportion of women receiving antenatal services. Most participants were young, urban, and booked, all of which are factors known to support better pregnancy outcomes. Similar observations have been reported elsewhere. Subedi et al. found that women who attended antenatal care had fewer complications, largely because risks were identified and managed earlier.¹² Likewise, Elrasheed et al. showed that structured antenatal care was associated with improved maternal outcomes in hospital settings.¹³

Postpartum hemorrhage was uncommon in this cohort and did not show strong associations with most variables. Even so, the slightly higher proportion among unbooked women suggests that some risk persists where antenatal care is lacking. Earlier studies have reported stronger links. Bangera et al. a) observed that hemorrhagic complications were more frequent in unbooked women, often due to delayed presentation and limited monitoring during pregnancy.¹³ Setia et al. reported similar findings, with higher rates of postpartum hemorrhage among women who had not received antenatal care.¹⁴ In contrast, the lower rates seen here may reflect improvements in intrapartum care, though the underlying pattern has not disappeared.

Placental abruption showed a clearer and more consistent association. Women from rural areas and those who were unbooked faced a significantly higher risk. This aligns with existing evidence that limited access to routine monitoring can delay the detection of hypertensive disorders and other underlying conditions. Oguejiofor et al. reported that unbooked women were substantially more likely to develop serious obstetric complications, including those related to placental pathology.¹⁵ Elrasheed et al. also noted higher rates of hypertensive and hemorrhagic complications among unbooked women.¹³ The pattern observed in this study reinforces the importance of regular antenatal follow-up, particularly for women in rural settings.

Although acute renal failure was rare, its distribution was notable. All cases occurred among unbooked women, suggesting that delayed care allowed complications to progress unchecked. This finding is consistent with earlier work showing that severe maternal outcomes tend to cluster among women who present late. Subedi et al.¹⁵ and Oguejiofor et al.¹⁶ both reported that serious complications, including organ dysfunction, were more common in unbooked patients who had not been monitored during

pregnancy. Even with small numbers, the pattern remains clinically important.

Socioeconomic and obstetric factors showed weaker associations overall, although some trends persisted. Women from lower-income households and those with higher gravidity tended to have slightly higher complication rates. These differences did not reach statistical significance but are consistent with earlier findings that link socioeconomic disadvantage and higher parity with reduced access to care. Studies from India have shown that unbooked women are more likely to come from disadvantaged backgrounds and experience poorer outcomes as a result.^{14,15}

Taken together, the results suggest that while complication rates may be lower overall, differences between groups remain. Women who do not receive antenatal care, particularly those from rural or lower-income settings, continue to face higher risks, especially for more serious outcomes. Strengthening early engagement with antenatal services and improving access for underserved groups may help reduce these gaps further.

LIMITATIONS

This study was conducted at a single tertiary care hospital, which may limit how far the findings can be applied to other settings. The low number of complications and lack of information on key factors such as education and access to care may have affected the strength of the associations observed.

CONCLUSION

Overall, maternal complications were uncommon in this cohort, but women who had not received antenatal care faced higher risks, particularly for more serious outcomes. Strengthening early antenatal engagement, especially among rural and underserved populations, could help reduce these preventable complications.

Table 1: Distribution of baseline characteristics among the study participants.

Variables	n (%)
Age	
20 to 35 years	140 (89.2)
36 to 45 years	17 (10.8)
Gestational age	
≤39 weeks	141 (89.8)
>39 weeks	16 (10.2)
Residence status	
Urban	119 (75.8)
Rural	38 (24.2)
Booking status	
Booked	105 (66.9)
Unbooked	52 (33.1)
Gravida	
≤3	78 (49.7)
>3	79 (50.3)
Parity	
≤3	121 (77.1)
>3	36 (22.9)
Family monthly income	
≤60000	118 (75.2)
>60000	39 (24.8)
Occupational status	
Employed	126 (80.3)
Unemployed	31 (19.7)
Postpartum hemorrhage	
Yes	04 (2.5)
No	153 (97.5)
Placental Abruption	
Yes	09 (5.7)
No	148 (94.3)
Acute renal failure	
Yes	02 (1.3)
No	155 (98.7)
Total	157 (100)

Table 2: Distribution of patient characteristics according to the Postpartum hemorrhage groups.

Variables	Postpartum hemorrhage Yes n (%)	Postpartum hemorrhage No n (%)	P value
Age			0.35
20 to 35 years	03 (2.1)	137 (97.9)	
36 to 45 years	01 (5.9)	16 (94.1)	
Gestational age			0.49
≤39 weeks	04 (2.8)	137 (97.2)	
>39 weeks	00 (00)	16 (100)	

Residence status			0.25
Urban	04 (3.4)	115 (96.6)	
Rural	00 (00)	38 (100)	
Booking status			0.07
Booked	01 (1.0)	104 (99)	
Unbooked	03 (5.8)	49 (94.2)	
Gravida			0.31
≤3	01 (1.3)	77 (98.7)	
>3	03 (3.8)	76 (96.2)	
Parity			0.19
≤3	02 (1.7)	119 (98.3)	
>3	02 (5.6)	34 (94.4)	
Family monthly income			0.99
≤60000		115 (97.5)	
>60000	03 (2.5) 01 (2.6)	38 (97.4)	
Occupational status			0.78
Employed	03 (2.4)	123 (97.6)	
Unemployed	01 (3.2)	30 (96.8)	

Table 3: Distribution of patient characteristics according to the Placental Abruption groups.

Variables	Placental Abruption Yes n (%)	Placental Abruption No n (%)	P value
Age			0.28
20 to 35 years	09 (6.4)	131 (93.6)	
36 to 45 years	00 (00)	17 (100)	
Gestational age			0.29
≤39 weeks	09 (6.4)	132 (93.6)	
>39 weeks	00 (00)	16 (100)	
Residence status			0.01
Urban	03 (2.5)	116 (97.5)	
Rural	06 (15.8)	32 (84.2)	
Booking status			0.01
Booked	02 (1.9)	103 (98.1)	
Unbooked	07 (13.5)	45 (86.5)	
Gravida			0.74
≤3	04 (5.1)	74 (94.9)	
>3	05 (6.3)	74 (93.7)	
Parity			0.95
≤3	07 (5.8)	114 (94.2)	
>3	02 (5.6)	34 (94.4)	
Family monthly income			0.32
≤60000		110 (93.2)	
>60000	08 (6.8) 01 (2.6)	38 (97.4)	

Occupational status			
Employed	06 (4.8)	120 (95.2)	0.29
Unemployed	03 (9.7)	28 (90.3)	

Table 4: Distribution of patient characteristics according to the Acute renal failure groups.

Variables	Acute renal failure Yes n (%)	Acute renal failure No n (%)	P value
Age			0.62
20 to 35 years	02 (1.4)	138 (98.6)	
36 to 45 years	00 (00)	17 (100)	
Gestational age			0.63
≤39 weeks	02 (1.4)	139 (98.6)	
>39 weeks	00 (00)	16 (100)	
Residence status			0.42
Urban	02 (1.7)	117 (98.3)	
Rural	00 (00)	38 (100)	
Booking status			0.04
Booked	00 (00)	105 (100)	
Unbooked	02 (3.8)	50 (96.2)	
Gravida			0.15
≤3	02 (2.6)	76 (97.4)	
>3	00 (00)	79 (100)	
Parity			0.43
≤3	02 (1.7)	119 (98.3)	
>3	00 (00)	36 (100)	
Family monthly income			0.41
≤60000	02 (1.7)	116 (98.3)	
>60000	00 (00)	39 (100)	
Occupational status			0.48
Employed	02 (1.6)	124 (98.4)	
Unemployed	00 (00)	31 (100)	

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