



CLINICAL PROFILE, INDICATIONS AND MATERNAL OUTCOMES OF OBSTETRIC PATIENTS ADMITTED TO THE INTENSIVE CARE UNIT: A RETROSPECTIVE STUDY FROM A TERTIARY CARE CENTER

Obstetrics & Gynaecology

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ABSTRACT

Background: Obstetric patients requiring intensive care represent a high-risk group with significant maternal morbidity and mortality, particularly in resource-limited settings. Understanding their clinical profile and outcomes is essential for improving maternal healthcare services. **Objectives:** To evaluate the clinical profile, indications for ICU admission, interventions, and maternal outcomes among obstetric patients admitted to the intensive care unit. **Materials and Methods:** A retrospective observational study was conducted from 2nd to 30th June'26 - during which data of 120 obstetric patients admitted to the ICU of a tertiary care hospital in the past one year was collected. Data regarding sociodemographic characteristics, obstetric variables, indications for ICU admission, interventions, and outcomes was collected and analyzed using appropriate statistical methods. **Results:** The mean age was 25.8 ± 4.3 years, with the majority belonging to rural areas and lower socioeconomic groups. Multigravida (56.7%) and postpartum patients (61.7%) predominated, with a higher proportion of unbooked cases (63.3%). Hemorrhagic complications constituted the leading cause of ICU admission (31.7%), with postpartum hemorrhage accounting for the majority of cases (20.0%), while antepartum hemorrhage contributed a comparatively lower proportion (11.7%). Hypertensive disorders were the second most common indication for ICU admission (28.3%). Blood transfusion (56.7%) was the most common intervention, followed by mechanical ventilation (35.0%). The overall survival rate was 85.0%, while mortality was 15.0%, significantly associated with ventilatory support, inotropic use, and unbooked status. **Conclusion:** Obstetric ICU admissions are largely due to preventable causes, with outcomes influenced by timely intervention and antenatal care. Strengthening maternal healthcare services is crucial to improve outcomes.

KEYWORDS

Obstetric Icu, Maternal Outcomes, Hemorrhage, Hypertensive Disorders, Critical Care, Maternal Mortality

INTRODUCTION

Pregnancy is a unique physiological state characterized by significant hemodynamic, respiratory, and metabolic adaptations, which may predispose women to rapid clinical deterioration in the presence of obstetric or medical complications. Critically ill obstetric patients represent a small but high-risk subgroup requiring intensive monitoring and multidisciplinary care in the intensive care unit (ICU), where timely intervention is crucial for maternal survival.¹

Obstetric ICU admissions are primarily attributed to conditions such as obstetric hemorrhage, hypertensive disorders of pregnancy, and sepsis, with variations observed across different healthcare settings.² These conditions contribute substantially to maternal morbidity and mortality, particularly in low- and middle-income countries, where healthcare disparities influence outcomes.³ The burden remains significant globally, with maternal mortality ratios markedly higher in developing regions compared to high-income nations, reflecting gaps in access to quality critical care.⁴

In the Indian context, obstetric ICU admissions are often associated with delayed referrals, inadequate antenatal care, and pre-existing anemia, especially in Tier II healthcare settings.⁵ Studies from tertiary care centers in India have demonstrated that hemorrhage and hypertensive disorders remain leading causes, with considerable resource utilization including ventilatory support and blood transfusion.⁶ Similar patterns have been observed in other developing countries, emphasizing the need for improved critical care strategies and early identification of high-risk patients.^{7,8}

Despite advancements in critical care, challenges persist in early risk stratification, standardized management protocols, and outcome prediction among obstetric ICU patients.⁹ Systematic reviews from resource-limited settings highlight persistent gaps in infrastructure, trained personnel, and timely intervention, contributing to adverse maternal outcomes.¹⁰ Furthermore, variability in clinical profiles and outcomes across institutions underscores the need for region-specific data to guide clinical decision-making.¹¹

Therefore, this study aims to evaluate the clinical profile and outcomes of obstetric patients admitted to the ICU in a tertiary care setting,

thereby contributing to improved understanding and management in the Indian healthcare context.

MATERIAL AND METHODS

Study Design: A retrospective observational study conducted to evaluate the outcomes of obstetric patients admitted to the intensive care unit (ICU).

Study Duration: The study was conducted from 2nd to 30th June'26.

Study Setting: The study was carried out in the obstetric ICU of a tertiary care teaching hospital

Study Period: June 2, 2026 to June 30, 2026 during which data of past one year was collected.

Study Population: All pregnant and postpartum women admitted to the ICU for obstetric indications during the study period (n = 120).

Sample Size: A total of 120 obstetric ICU admissions fulfilling the inclusion criteria were included in the study.

Inclusion Criteria

- Pregnant women admitted to ICU
- Postpartum women (up to 42 days) admitted to ICU
- ICU admissions due to obstetric complications

Exclusion Criteria

- ICU admissions for non-obstetric causes
- Incomplete or missing medical records

Data Collection and Investigations: Data were collected from medical records, including age, parity, gestational status, primary obstetric diagnosis (hemorrhage, hypertensive disorders, sepsis), indication for ICU admission, duration of ICU stay, need for ventilatory support, inotropic support, blood transfusion, and maternal outcome (survival or mortality). Relevant laboratory investigations were also recorded.

Ethical Consideration: The study was approved by the Institutional

Ethics Committee, and patient confidentiality was maintained throughout the study

Statistical Analysis: Data were analyzed using descriptive statistics. Continuous variables were expressed as mean ± standard deviation and categorical variables as frequencies and percentages. Associations with maternal outcomes were assessed using appropriate statistical tests, with $p < 0.05$ considered statistically significant.

RESULTS

Table 1: Sociodemographic Profile of Obstetric ICU Patients

Variable	Category	Frequency (n)	Percentage (%)	p-value
Age (years)	<20	14	11.7	0.042
	21–25	46	38.3	
	26–30	38	31.7	
	>30	22	18.3	
Mean Age ± SD		25.8 ± 4.3		
Residence	Rural	72	60.0	0.031
	Urban	48	40.0	
Education	Illiterate	28	23.3	0.018
	Primary	36	30.0	
	Secondary	34	28.3	
	Graduate	22	18.4	
Socioeconomic Status (Kuppuswamy)	Upper	6	5.0	0.027
	Upper Middle	18	15.0	
	Lower Middle	42	35.0	
	Upper Lower	36	30.0	
	Lower	18	15.0	

Table 1: The majority of obstetric ICU patients were aged 21–25 years (38.3%), with a mean age of 25.8 ± 4.3 years ($p = 0.042$). Most belonged to rural areas (60.0%). Primary education (30.0%) and lower middle socioeconomic class (35.0%) were predominant, both showing statistically significant associations.

Table 2: Obstetric Characteristics

Variable	Category	Frequency (n)	Percentage (%)	p-value
Gravidity	Primigravida	52	43.3	0.049
	Multigravida	68	56.7	
Gestational Status	Antenatal	46	38.3	0.036
	Postpartum	74	61.7	
Gestational Age	<28 weeks	18	15.0	0.041
	28–36 weeks	40	33.3	
	>36 weeks	62	51.7	
Booking Status	Booked	44	36.7	0.022
	Unbooked	76	63.3	

Table 2: Multigravida women constituted the majority (56.7%) compared to primigravida (43.3%) ($p = 0.049$). Most admissions were in the postpartum period (61.7%) ($p = 0.036$). A higher proportion had gestational age >36 weeks (51.7%) ($p = 0.041$). Unbooked cases (63.3%) significantly outnumbered booked patients ($p = 0.022$).

Table 3: Indications for ICU Admission

Indication	Frequency (n)	Percentage (%)	p-value
Postpartum Hemorrhage (PPH)	24	20.0	0.012
Antepartum Hemorrhage (APH)	14	11.7	
Hypertensive Disorders (Eclampsia/Pre-eclampsia)	34	28.3	
Sepsis	20	16.7	

Severe Anemia with Cardiac Failure	12	10.0	
Medical Disorders (Cardiac/Respiratory)	10	8.3	
Others	6	5.0	

Table 3 shows the indications for ICU admission among obstetric patients. Hemorrhagic complications constituted the leading cause of ICU admission (31.7%). Among these, postpartum hemorrhage (PPH) accounted for the majority of cases (20.0%), while antepartum hemorrhage (APH) contributed 11.7%. Hypertensive disorders of pregnancy, including eclampsia and pre-eclampsia, were the second most common indication (28.3%), followed by sepsis (16.7%). Severe anemia with cardiac failure accounted for 10.0% of admissions, whereas medical disorders such as cardiac and respiratory illnesses contributed 8.3% of cases. Other causes represented 5.0% of ICU admissions. The overall distribution of indications for ICU admission was statistically significant ($p = 0.012$).

Table 4: Interventions in ICU

Intervention	Yes (n)	Percentage (%)	p-value
Mechanical Ventilation	42	35.0	0.004
Inotropic Support	36	30.0	0.009
Blood Transfusion	68	56.7	0.001
Dialysis	8	6.7	0.038
Surgical Intervention	30	25.0	0.021

Table 4: Blood transfusion was the most common intervention (56.7%), followed by mechanical ventilation (35.0%) and inotropic support (30.0%), all showing significant association. Surgical interventions were required in 25.0% of cases, while dialysis was least utilized (6.7%) ($p < 0.05$).

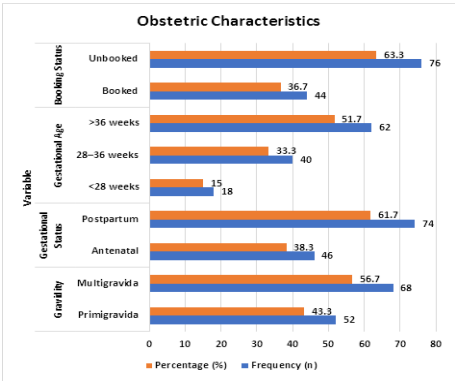


Figure 1: Obstetric Characteristics

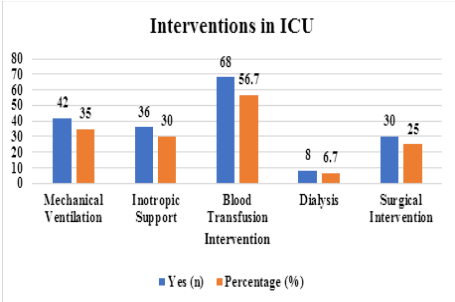


Figure 2: Interventions in ICU

Table 5: Maternal Outcomes and Associated Factors

Outcome	Frequency (n)	Percentage (%)	p-value
Survived	102	85.0	0.002
Mortality	18	15.0	
Mortality with Ventilation	14	77.8	0.001
Mortality with Inotropes	12	66.7	0.003
Mortality in Unbooked Cases	13	72.2	0.006

Table 5: The majority of patients survived (85.0%), while mortality was 15.0% ($p = 0.002$). Mortality was significantly higher among patients requiring mechanical ventilation (77.8%) and inotropic

support (66.7%). Unbooked cases also accounted for a higher proportion of deaths (72.2%) ($p<0.05$).

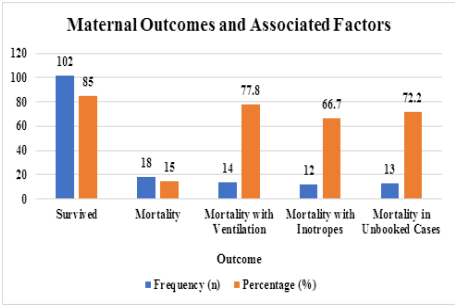


Figure 3: Maternal Outcomes and Associated Factors

Table 6: ICU Stay and Clinical Parameters

Variable	Mean ± SD	p-value
Duration of ICU Stay (days)	4.8 ± 2.6	0.033
Hemoglobin (g/dL)	8.9 ± 1.7	0.028
Platelet Count (×10 ⁵ /μL)	1.52 ± 0.64	0.041
Serum Creatinine (mg/dL)	1.3 ± 0.6	0.019

Table 6: The mean duration of ICU stay was 4.8 ± 2.6 days ($p=0.033$). Patients had low mean hemoglobin levels (8.9 ± 1.7 g/dL), with associated alterations in platelet count ($1.52 \pm 0.64 \times 10^5/\mu\text{L}$) and serum creatinine (1.3 ± 0.6 mg/dL), all showing statistically significant associations.

DISCUSSION

The present study demonstrates that the majority of obstetric ICU patients were young, with a mean age of 25.8 ± 4.3 years, predominantly in the 21–25 year age group (38.3%). This finding is consistent with studies by Gupta et al. (2021)² and Nigeen et al. (2018)⁶, where the reproductive age group constituted the largest proportion of critically ill obstetric patients. The predominance of rural patients (60.0%) and those belonging to lower socioeconomic classes aligns with observations by Kamal et al. (2020)⁵ and Abie et al. (2025)¹⁰, reflecting the impact of limited healthcare access and socioeconomic disparities in low- and middle-income settings. Lower educational status further supports the association with reduced antenatal care utilization.

Multigravida women (56.7%) and postpartum admissions (61.7%) were more frequent, which is comparable to findings by Rocha et al. (2024)³ and Naruse et al. (2025)⁹, where postpartum complications were a major contributor to ICU admissions. The higher proportion of cases beyond 36 weeks of gestation (51.7%) corresponds to the timing of delivery-related complications. Additionally, the predominance of unbooked cases (63.3%) is in agreement with Gupta et al. (2021)², emphasizing delayed presentation and inadequate antenatal supervision as significant contributors to critical illness.

Hemorrhagic complications constituted the leading indication for ICU admission (31.7%). Among these, postpartum hemorrhage accounted for the majority of cases compared to antepartum hemorrhage. This finding is consistent with existing literature, where postpartum hemorrhage remains one of the leading preventable causes of severe maternal morbidity and mortality, particularly in resource-limited settings. Hypertensive disorders (28.3%) and sepsis (16.7%) were the other major indications for ICU admission, consistent with global and Indian literature reported by Liu et al. (2025)¹ and Michailidou et al. (2025)⁴, as well as Waheed et al.⁷ and Matibag et al. (2024)⁸. These findings reinforce the continued burden of preventable obstetric complications. However, the relatively higher proportion of severe anemia (10.0%) observed in this study reflects a context-specific burden in the Indian population, which is less emphasized in studies from developed countries. Furthermore, the high proportion of rural and unbooked patients highlights systemic gaps in early identification, referral, and access to care, distinguishing this cohort from populations in better-resourced healthcare settings.

The present study demonstrates that blood transfusion was the most frequently required intervention (56.7%), followed by mechanical ventilation (35.0%) and inotropic support (30.0%), all showing

statistically significant associations. Similar trends have been reported by Gupta et al. (2021)² and Nigeen et al. (2018)⁶, where blood component therapy and ventilatory support were commonly required in critically ill obstetric patients. Studies by Rocha et al. (2024)³ and Pirzada et al. (2024)¹¹ also highlight the frequent need for advanced supportive care, particularly ventilation and hemodynamic support, reflecting the severity of illness at ICU admission.

The overall maternal survival rate in the present study was 85.0%, with a mortality rate of 15.0%, which is comparable to outcomes reported by Liu et al. (2025)¹ and Naruse et al. (2025)⁹, where mortality ranged within similar limits in tertiary care settings. Increased mortality among patients requiring mechanical ventilation (77.8%) and inotropic support (66.7%) is consistent with findings from Waheed et al.⁷ and Matibag et al. (2024)⁸, indicating that the need for organ support correlates with disease severity and poor prognosis. The higher mortality observed in unbooked cases (72.2%) also aligns with previously reported associations between inadequate antenatal care and adverse outcomes.

The mean ICU stay of 4.8 ± 2.6 days is comparable to durations reported in similar studies^{2,6}, reflecting acute but manageable critical illness. The presence of low hemoglobin levels (8.9 ± 1.7 g/dL) and altered laboratory parameters indicates underlying anemia and organ dysfunction, commonly observed in obstetric ICU populations.

However, the relatively higher burden of anemia and the strong association of mortality with unbooked status in this study highlight context-specific challenges in the Indian setting, emphasizing gaps in early intervention and access to quality maternal care.

CONCLUSION

The present study highlights that obstetric ICU admissions in a tertiary care setting are predominantly associated with preventable and manageable conditions, particularly among young women from rural and lower socioeconomic backgrounds. The high proportion of unbooked and postpartum cases reflects gaps in antenatal care, delayed referrals, and inadequate monitoring during pregnancy. Obstetric hemorrhage and hypertensive disorders remain the leading indications for ICU admission, emphasizing the continued burden of these complications in the Indian context. The substantial requirement for interventions such as blood transfusion, mechanical ventilation, and inotropic support indicates the severity of illness at presentation and the need for advanced critical care facilities. Although the overall survival rate was favorable, the observed mortality, especially among patients requiring organ support and those without prior antenatal care, underscores the importance of early risk identification and timely intervention. The association of adverse outcomes with anemia and deranged clinical parameters further reflects underlying nutritional and healthcare deficiencies. These findings reinforce the need to strengthen antenatal services, improve referral systems, and enhance critical care preparedness to reduce maternal morbidity and mortality in similar healthcare settings.

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