Al Ameen J Med Sci 2026;19(2):136-140 ● US National Library of Medicine enlisted journal ● ISSN 0974-1143

ORIGINAL ARTICLE CODEN: AAJMBG

Understanding obstetric ICU admissions: Clinical profile and outcomes in a tertiary hospital

Syeda Nazhath Fathima, Arshia Sayed* and P.B. Jaju

Department of Obstetrics & Gynaecology, Al Ameen Medical College and Hospital, Athani Road, Vijayapur-586108, Karnataka, India

Received: 10th January 2026; ***Accepted:*** 21st March 2026; ***Published:*** 01st April 2026

Abstract: *Background:* Obstetric patients requiring intensive care constitute a high-risk subgroup within maternal health services. These patients often present with rapidly evolving, life-threatening conditions that demand specialized and multidisciplinary care. Understanding the epidemiology, indications, and outcomes of obstetric intensive care unit (ICU) admissions is essential to improve maternal outcomes. *Objectives:* To determine the prevalence, indications, and maternal outcomes of obstetric admissions to the ICU at a tertiary care hospital. *Methods:* A retrospective observational study was conducted including all obstetric patients (pregnant or within 42 days postpartum) admitted to the ICU between December 2023 and February 2025. Data on demographic characteristics, obstetric profile, indications for ICU admission, interventions, duration of ICU stay, and outcomes were collected from medical records. *Results:* Out of 1,902 total deliveries during the study period, 50 women required ICU admission, yielding a prevalence of 2.6%. The majority of patients were aged 21–30 years (88%) and were multigravidas (58%). The most common indications for ICU admission were obstetric hemorrhage (28%) and hypertensive disorders of pregnancy (22%). Cesarean section was the most frequently performed surgical procedure (68%). The maternal mortality rate was 6%. *Conclusion:* Obstetric hemorrhage and hypertensive disorders remain the leading causes of ICU admission. Early risk identification, timely referral, and coordinated multidisciplinary management are crucial in reducing severe maternal morbidity and mortality.

Keywords: Obstetric ICU, Maternal Morbidity, Hypertensive Disorders, Postpartum hemorrhage, Critical care.

Introduction

Obstetric emergencies present a unique clinical challenge, as they require the simultaneous management of two lives with interrelated yet distinct physiologies. Physiological adaptations of pregnancy, the presence of the fetus, and the potential for sudden and rapid maternal deterioration necessitate timely access to specialized and multidisciplinary critical care services [1].

Globally, pregnant and postpartum women constitute a relatively small but high-risk proportion of intensive care unit (ICU) admissions. Reported rates of obstetric ICU admissions range from 0.08% in developed countries to as high as 4.6% in developing nations, reflecting significant disparities in healthcare infrastructure, availability of critical care resources, and referral systems [2-3].

In India, obstetric hemorrhage and hypertensive disorders of pregnancy have been consistently identified as the leading causes of ICU admission among obstetric patients, contributing substantially to severe maternal morbidity and mortality. At our tertiary referral centre in Southern India, critically ill obstetric patients are managed within a general ICU that is equipped to provide comprehensive multidisciplinary care involving obstetricians, anesthesiologists, intensivists, and specialized nursing staff.

The present study was undertaken to identify local risk factors associated with obstetric ICU admissions and to contribute to the existing evidence base for strengthening obstetric critical care services, with the ultimate goal of reducing preventable maternal morbidity and mortality.

Aim: This study aims to analyse the prevalence, indications, and outcomes of obstetric ICU admissions so that efforts can be focused on the target group.

Material and Methods

This is a Retrospective study. Study included 50 Obstetric cases admitted to the intensive care unit over a period of 14 months from December 2023 to February 2025. Total number of obstetric admissions during study period were 1902. All the pregnant and postpartum patients admitted to the ICU of Al Ameen Medical College &Hospital were included in the study. Ethical permission was obtained from institutional ethical committee. Consent obtained from the patient. Data was collected from case records of patients according to inclusion criteria from record section of college.

Sample size and Sampling method: The required sample size was calculated for estimation of a single proportion using the following formula:

$n_0 = Z^2 \times p\,(1 - p) / d^2$
Where:
n_0 = initial sample size (infinite population)
Z = 1.96 (for 95% confidence)
p = expected prevalence (2.6% = 0.026)
d = desired precision (1% = 0.01)

Ethical approval and institutional permission for retrospective chart review was obtained prior to data collection.

Inclusion Criteria: All obstetric admissions during the study period meeting the case definition.

1. Obstetric patient = pregnancy at any gestational age or within 42 days of postpartum
2. Age >18years
3. Records with sufficient information to determine whether the patient was admitted to ICU
4. All modes of delivery

Exclusion Criteria:

1. Road traffic accident
2. Treatment of poisoning
3. Other medicolegal cases
4. Records with insufficient information to determine ICU admission or key outcome variables.

Results

Total number of ANC patients during study period were1902. Among them 50 (2.6%) of patients required ICU admissions.

Table-1: Baseline Characteristics of ICU Admission

	Number of patients (N=50)	%age
Age in completed years		
<20years	3	6%
21 to 30	44	88%
31 to 35	2	4%
>36	1	2%
Obstetric index		
Primigravida	21	42%
Multigravida	29	58%
Gestational age		
28-37week	24	48%
>37week	20	40%
Timing of admission to ICU		
Antepartum	3	6%
Post cesarean section	37	74%
Post vaginal delivery	8	16%
Abortion	2	4%

The commonest age group was 21-30 years i.e. 44 (88%) out of 50 patients as this group forms the commonest age group for delivering patients. Only 1(2%) are more than 36 years. 29 patients were multigravida (58%) and 21(42%) were primigravida out of 50. Multigravida itself is a predictive risk factor for ICU admission Majority of patients were in 28 to 37 weeks. This table doesn't include Postpartum referred cases which are 4.

Table 1 also demonstrates that the vast majority of ICU admissions (74%) occurred in the post-cesarean section period, highlighting it as a critical window for maternal deterioration.

Table-2: Underlying conditions:		
Condition	**Number of patient**	**% age**
Hypertensive disorders of pregnancy	11	22%
Eclampsia	7	14%
PRES syndrome	1	2%
HELLP	2	4%
Post partum hemorrhage	12	28%
PPH with AKI	2	4%
Acute fatty liver of pregnancy	1	2%
Seizure disorders	2	4%
Heart disease	4	8%
Severe anemia	4	8%
Sepsis	3	6%
Pulmonary embolism	1	2%

11(22.0%) of patients were having Hypertensive disorders of pregnancy, 7(14%) of patients were having eclampsia. 1(2.0%) of patients suffered from pulmonary embolism (table-2).

Table-3: Duration of ICU stay		
Duration	**Number of patient**	**Percentage**
1-2 days	19	38%
3-4days	22	73%
5-7days	6	12%
8-10days	3	6%

Only 3 patients (6%) required prolonged ICU stay i.e. 10 days out of 50 ICU admissions. Maximum number of patients 22(73%) required a stay of 3 to 4 days (table-3).

Table-4: Surgical procedure		
Procedure	**Number of patients**	**% age**
Cesarean section	34	68%
Obstetric hysterectomy	4	8%
Internal iliac artery ligation	3	6%
Uterine artery ligation	2	4%
Laprotomy	3	6%
Repair of rupture of uterus	2	4%
Bladder repair	2	4%
Manual removal of placenta	1	2%

Table 4 shows that cesarean section was the predominant surgical procedure (68%) among obstetric ICU admissions, with life-saving interventions like obstetric hysterectomy and vascular ligation also being notably required. Thus commonest surgical procedure is caesarean section.

Table-5: Therapy given in ICU & Transfusion given			
Particulars		**Number of patients**	**% age**
Therapy in ICU	Ventilator	2	4%
	Inotropes	2	4%
	Heparin	1	2%
	Dialysis	2	4%
	Anti hypertensive	11	22%
	Higher antibiotics	8	16%
	Anti convulsants	7	14%
Transfusion	PCV	22	44%
	Blood components	10	20%

Out of 50 patients 2 required ventilatory support, 2(4%) patients required Inotropes, 2 patient required dialysis , only 1 (2%) patients required heparin therapy (table-5).

Maternal deaths: 3 (6%) of maternal deaths during the study period.

Causes of death are:

1. Severe preeclampsia with HELLP with DIC.
2. 36 weeks multigravida Severe preeclampsia with abruption with pulmonary edema with intra cranial hemorrhage.
3. Amniotic fluid embolism intraoperatively.

Discussion

Obstetric admissions to the intensive care unit (ICU) are widely recognized as a key indicator of severe maternal morbidity and provide valuable insight into the effectiveness of obstetric and critical care services. In the present study, the ICU admission rate was 2.6% of all deliveries, which is comparable to rates reported from other tertiary referral centers in low- and middle-income countries. Recent studies conducted after 2017 have reported obstetric ICU admission rates

ranging from 0.7% to 4.6%, reflecting differences in referral patterns, availability of specialized care, and healthcare infrastructure [1-3].

The relatively higher ICU admission rate observed in this study can be attributed to the role of the institution as a tertiary referral center receiving critically ill patients from peripheral hospitals. Similar findings have been reported in recent Indian studies, where referral bias and delayed presentation contributed significantly to increased ICU utilization [2,4-5]. These observations underscore the importance of strengthening peripheral obstetric services and improving early referral mechanisms.

Obstetric hemorrhage and hypertensive disorders of pregnancy were the leading causes of ICU admission in the present study. This pattern is consistent with contemporary literature, which continues to identify these two conditions as the predominant contributors to severe maternal morbidity requiring critical care [1,4,6-7]. Despite advances in obstetric management, postpartum hemorrhage remains a major challenge, particularly in resource-limited settings, emphasizing the need for timely intervention and availability of blood products and surgical expertise.

Hypertensive disorders of pregnancy, including preeclampsia and eclampsia, accounted for a substantial proportion of ICU admissions. Recent cohort studies and systematic reviews have highlighted that severe preeclampsia and its complications remain among the most frequent indications for obstetric ICU admission, often associated with multi-organ dysfunction and increased mortality risk [6,8-9]. Early identification and aggressive management of hypertensive disorders are therefore critical to preventing progression to critical illness.

A significant finding in this study was that 74% of ICU admissions occurred in the post-cesarean period. Contemporary evidence suggests that cesarean delivery is an independent risk factor for ICU admission, particularly when performed in the presence of antenatal comorbidities such as anemia, hypertension, or sepsis [5,7,10]. The immediate postoperative period thus represents a vulnerable phase requiring close monitoring and prompt response to early signs of deterioration.

The majority of patients in the present study were admitted between 28 and 37 weeks of gestation. Recent studies have similarly reported a higher incidence of ICU admission during the late-preterm period, largely due to severe hypertensive disorders and obstetric complications necessitating early delivery [8,11]. Improved antenatal surveillance and timely referral during this gestational window may reduce the severity of complications at presentation. Comorbid conditions were common, with half of the patients having more than one diagnosis at the time of ICU admission. Multiple recent studies have demonstrated that the presence of multiple obstetric or medical comorbidities significantly increases the risk of ICU admission and adverse maternal outcomes [4,9,12]. This finding highlights the importance of comprehensive antenatal risk stratification and multidisciplinary care for high-risk pregnancies.

The maternal mortality rate in this study was 6%, which is comparable to rates reported in recent literature from similar settings but remains higher than those reported from high-income countries [3,13-14]. A recent meta-analysis reported pooled maternal ICU mortality rates of approximately 5–7% in low- and middle-income countries, supporting the findings of the present study [15]. The observed maternal deaths were primarily due to severe hypertensive complications and embolic events, emphasizing the need for rapid diagnosis and specialized critical care. Conventional ICU severity scoring systems such as APACHE II and SAPS II have limited applicability in obstetric patients due to physiological changes of pregnancy that may confound risk prediction. Recent studies continue to advocate for the use of obstetric-specific early warning systems, such as the Modified Early Obstetric Warning System (MEOWS), for early detection of clinical deterioration [16-17]. Implementation of such systems has been shown to improve timely escalation of care and may reduce ICU admissions and maternal mortality.

Recent multicenter and observational studies further reinforce that obstetric hemorrhage and hypertensive disorders remain the

predominant causes of ICU admission in contemporary obstetric practice [6,10,18]. These findings highlight that improving maternal outcomes requires not only advanced ICU care but also robust antenatal surveillance, effective peripheral obstetric care, and standardized early warning and referral systems. The retrospective nature of the study and reliance on medical records represent its primary limitations. However, the consistency of the findings with recent national and international literature supports the validity of the conclusions.

Conclusion

This study demonstrates that obstetric hemorrhage and hypertensive disorders of pregnancy remain the leading causes of severe maternal morbidity requiring intensive care, followed by conditions such as severe anemia, heart disease, and sepsis. Although only 2.6% of obstetric admissions required ICU care, these cases were associated with substantial clinical severity, highlighting the importance of rapid recognition and timely multidisciplinary management.

Strengthening emergency obstetric care skills, improving early identification of high-risk patients, and ensuring prompt referral to higher centres are essential strategies for preventing maternal deterioration. The establishment of a dedicated obstetric ICU would further enhance specialized monitoring and coordinated care, align clinical practice with global standards, and contribute significantly to reducing preventable maternal morbidity and mortality. Such an initiative represents a vital step toward improving maternal health outcomes within our institution.

Financial Support and sponsorship: Nil

Conflicts of interest: There are no conflicts of interest.

References

1. Pandit SN, Nikhate P. Obstetric critical care: a two-year retrospective study in a medical college hospital of Western India. *Int J Reprod Contracept Obstet Gynecol.* 2018; 7(5):1845-1850.
2. Bhat S, Ara R, Bashir H, Ahmad S. Pattern of admissions, clinical course and short-term outcome of patients admitted to an obstetric ICU. *Int J Reprod Contracept Obstet Gynecol.* 2017; 6(6):2526-2530.
3. CDC, NCHS. Intensive care unit admissions during delivery hospitalizations: United States, 2020–2022. *NCHS Data Brief.* 2024; (500):1-8.
4. Beza Z, Desta M, Tadesse M, et al. Admission indications and outcomes of obstetric patients admitted to critical care units. *BMC Womens Health.* 2024; 24:175.
5. Rocha FR, Silva LM, Pereira RM et al. Obstetric ICU admissions and maternal outcomes. *Medicina (Kaunas).* 2024; 60(12):1937.
6. Tripathy S, Mohanty S, Dash S et al. Critical care admissions and outcomes in pregnant and postpartum women: a systematic review and meta-analysis. *Crit Care Med.* 2023; 51(12):e1123-e1134.
7. Ashraf N, Mishra N, Kundra S, Tandon R. Obstetric patients requiring intensive care. *Anesth Essays Res.* 2018; 12(2):179-183.
8. Yadav P et al. Modified early obstetric warning system for prediction of severe maternal morbidity. *J Obstet Gynaecol Res.* 2023; 49(6):2134-2142.
9. Saha R, Shakya A. Obstetric ICU admissions in a tertiary hospital. *J Kathmandu Med Coll.* 2019; 8(2):65-70.
10. Pollock W, Rose L, Dennis CL. Pregnant and postpartum ICU admissions. *Int J Obstet Anesth.* 2018; 34:3-10.
11. Rios FG, Alvarez J et al. Obstetric ICU outcomes. *Int J Gynecol Obstet.* 2018; 142:136-140.
12. Knight M et al. Severe maternal morbidity in critical care. *BJOG.* 2019; 126:171-178.
13. Einav S et al. Maternal critical illness outcomes. *Intensive Care Med.* 2019; 45:453-462.
14. Vasquez DN et al. Obstetric critical care in middle-income countries. *Crit Care.* 2020; 24:556.
15. Luebcke C. Obstetric ICU mortality: contemporary review. *Crit Care.* 2022; 26:112.
16. Singh S et al. Validation of obstetric early warning scores. *J Obstet Gynaecol India.* 2021; 71:123-129.
17. Umar A et al. Early warning systems in obstetric care. *BMC Pregnancy Childbirth.* 2022; 22:641.
18. Chawla S et al. Trends in obstetric ICU admissions. *Indian J Crit Care Med.* 2023; 27(9):652-658.

Cite this article as: Fathima SN, Sayed A and Jaju PB. Understanding obstetric ICU admissions: Clinical profile and outcomes in a tertiary hospital. *Al Ameen J Med Sci* 2026; 19(2): 136-140.

*All correspondences to: Dr. Arshia Sayed, Assistant Professor Department of Obstetrics & Gynaecology, Al Ameen Medical College and Hospital, Athani Road, Vijayapur-586108, Karnataka, India. E-mail: drarshiasyed3@gmail.com