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Clinical Profile of Obstetric Admission in a Tertiary Care Intensive Care Centre in Northern India

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ABSTRACT

Obstetric critical care and interventions in intensive care unit (ICU) can improve the maternal outcome. ICU admission is on rise in pregnant women due to factors including increasing maternal age, increasing caesarean rates, levels of obesity and other comorbidities. We retrospectively studied the peripartum admissions (pregnant or within 6-weeks postpartum) in obstetric ICU in SMGS hospital, GMC Jammu over a period of one year (from Jan, 2023 to Dec, 2023) in terms of demography, diagnosis and comorbidities at time of admission, length of stay, ICU care and interventions given, outcome and ICU admission rate. Their mean age was 30.12±5.0 years. Out of 23804 obstetric admissions during the study period, a total of 305 patients were admitted to ICU with 1.28% as the rate of ICU admission. 42.47% had an obstetric cause of admission, whereas 14.1% had a non-obstetric cause of admission in the ICU. Among obstetric causes, obstetric hemorrhage was seen in 42.47% cases followed by hypertensive disorders of pregnancy in 29.77% cases and sepsis in 17.93% cases. Among non-obstetric causes, anemia was prevalent in 7.2% followed by epilepsy in 3.9%, cardiac disorders in 1.3% and others (like chronic or acute renal failure, Diabetes) in 1.3% cases. Average stay in the ICU was 6.9±3.99 days. As intervention, 84.59% patients required blood or blood product transfusion followed by 35.08% requiring mechanical ventilation and 20% requiring ianotropic support. Out of 20 patients died, 7 (35%) died of complications of obstetrics hemorrhage while 8 (40%) died of complications of hypertensive disorder sequele. The data revealed that ICU admissions is common in old age (>30 years), multigravidae with caesareans as a more common mode of delivery. The leading cause of admission was obstetrics hemorrhage followed by hypertensive disorders of pregnancy as the major cause of admission. The majority of patients required blood or blood products transfusions, mechanical ventilation, vasopressors Notably, the majority died of complications of obstetrics hemorrhage while followed by complications of hypertensive disorder sequele.

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Key Words

Intensive care unit, outcome, interventions, caesarean, maternal mortality

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INTRODUCTION

Maternal mortality is considered a basic health indicator that reflects the adequacy of health care systems and major causes are preventable. According to Maternal mortality ratio estimates 2020 [Source: WHO Global Health Observatory (WHO GHO) 2023], India had a maternal mortality ratio of 102.7 maternal deaths per 100 000 live births in 2020 (384 in 2000)[1]. Sustainable Development Goal (SDG) Target 3.1 calls for a reduction in the global maternal mortality ratio (MMR) to <70 per 100 000 by 2030; and no country should have an MMR greater than 140 per 100000[2-3]. Maternal mortality is just 'the tip of the iceberg' with a vast base which is unseen that is maternal morbidity (near miss). Making efforts to decrease maternal mortality and morbidity is a moral, economic and human rights related issue.

Intensive Critical care as a branch of medicine is a young specialty, but demand for critical care services has increased year over year for decades. The World Federation of Societies of Intensive and Critical Care Medicine defines an intensive care unit as "an organized system for the provision of care to critically ill patients that provides intensive and specialized medical and nursing care, an enhanced capacity for monitoring, and multiple modalities of physiologic organ support to sustain life during a period of acute organ system insufficiency[4]. Obstetric ICU is dedicated to manage only obstetric patients with critical medical, surgical or obstetrical complications.

Admission to an ICU has recently been identified as: a marker of severe maternal morbidity by the American College of Obstetrics and Gynecology[5]. Equity of critical care and maternity care is crucial and obstetric critical care entails both monitoring and therapeutic interventions. Obstetric admissions to the ICU is an indirect indicator of maternal morbidity and mortality, but measuring only ICU admissions underestimates the actual need for obstetric critical care.

Obstetric ICU admissions constitute mainly patients who have hemodynamic instability, respiratory dysfunction, neurological complications, acute kidney injury or haematological complications and who require two or more organ systems support, ventilatory or ianotropic support, invasive monitoring, massive blood transfusion, renal replacement therapy, having risk of sudden catastrophic deterioration or multidisciplinary team requirement.

Because of limited beds, scarce expert personnel, specialized technologies and expensive resources in the ICU, consideration must be given to the appropriateness of any ICU admission in terms of multiple factors, such as the individual patient's need and interventions required limited to the ICU, her diagnosis, clinical parameters directing ICU admission, prioritization by the patient's condition, prognosis and availability of both clinical expertise and ICU beds.

Aim and Objective: The objective of the present study is to determine the incidence, epidemiological characteristics, clinical profile and outcome of obstetric ICU admissions.

MATERIALS AND METHODS

We retrospectively studied the peripartum admissions (pregnant or within 6-weeks postpartum) in obstetric ICU in SMGS hospital, GMC Jammu over a period of a year from January 2023 to December 2023, in terms of demography, diagnosis and comorbidities at time of admission, length of stay, ICU care and interventions given, outcome and ICU admission rate. Data was collected from the patient's files, ICU records that were available in the Medical Record Section of our hospital and entered in a computerized database using MS Office Excel.

RESULTS AND DISCUSSIONS

This retrospective observational study was conducted for a period of one year from January 2023 to December 2023. Out of 23804 obstetric admissions during the study period, a total of 305 patients were admitted to ICU. Thus, the rate of ICU admission in our study was 1.28%. (Table1).

Table 1: ICU Admissions

	Number of patients	Rate of ICU admission
Total obstetric admissions	23804	1.28%
ICU admissions	305	

Majority of patients (39.67%) were in the age group of 25-30 years with an average age of years. 65.90% were multigravida, 66.22% belonged to >28 weeks gestational age and 68.89% delivered by caesarean delivery. (Table 2).

Table 2: Demographic Distribution of Patient Admitted in ICU

Parameter	Number of Patients	Percentage/Mean
Age Group		
<25 years	45	Mean age 30.12± 5.0 years
25-30 years	121	
31-35 years	89	
>35 years	50	
Parity		
Primigravida	104	34.10%
Multigravida	201	65.90%
Gestation Period at Admission to ICU		
<13 weeks	23	7.5%
13-28 weeks	16	5.2%
>28 weeks	220	66.22%
Post partum	46	20.9%
Mode of Delivery		
Vaginal	55	18.03%
Caesarean	210	68.89%
Instrumental assisted	2	0.66%
Abortion/ectopic	38	12.45%
Organ System Involved		
Single	260	85.25%
Multiple	45	14.75%
Residential Area		
Rural	238	78.03%
Urban	67	21.97%

Out of 305 admissions, 262 (42.47%) had obstetric cause as provisional diagnosis whereas 43 (14.1%) had non-obstetric cause of admission. Among obstetric causes, obstetric hemorrhage was seen in 38.08% cases followed by hypertensive disorders of pregnancy in 29.77% cases and sepsis in 17.93% cases. Among non-obstetric causes, anemia was prevalent in 7.2% followed by epilepsy in 3.9%, cardiac disorders in 1.3% and others (like CKD, ARF, ARDS, Diabetes) in 1.3% cases. (Table 3).

Table 3: Provisional Diagnosis of Patient on Admission to ICU

	Diagnosis	Number of Patients	Percentage
Obstetric Complication (85.9%) (262 patients)	Placenta previa /Antepartam hemorrhage	61	23.28%
	Placenta accreta syndrome	25	9.5%
	Postpartum hemorrhage	14	5.3%
	Rupture ectopic pregnancy	10	3.8%
	Molar pregnancy	2	0.7%
	Severe preeclampsia	58	22.13%
	HELP	12	4.5%
	Pulmonary edema	8	0.3%
	Puerperal sepsis/ septic abortion /septic shock	47	17.93%
	Obstructed labour	11	4.1%
	Peripartum car diomyopathy	14	5.3%
Non-Obstetric Complication (14.09%) (43 patients)	Severe anemia	22	7.2%
	Epilepsy	12	3.9%
	Cardiac disease	4	1.3%
	Others (CKD, ARF, Diabetes , ARDS)	5	1.3%

In our study as intervention, 84.59% patients required blood or blood product transfusion followed by 35.08% requiring mechanical ventilation, 20% requiring ianotropic support and 5.25% requiring renal dialysis. (Table 4).

Table 4: Interventions Done in ICU

Intervention	Number of Patients (%)
Mechanical ventilation	107 (35.08%)
Ianotropic support	61 (20%)
Echocardiogram	15 (4.92%)
computed tomography scan	4 (1.31%)
central line insertion	56 (18.36%)
Renal replacement therapy	16 (5.25%)
Tracheostomy	2 (0.66%)
Blood and blood products transfusion	258 (84.59%)

Out of 305 admissions in ICU, 274 patients (89.8%) were discharged, 20 patients died during course in the hospital while 10 patients were shifted to other departments and only one patient left against medical advice (LAMA). Average stay in the ICU was 6.9±3.99 days. Out of 20 patients died, 7 (35%) died of complications of obstetrics hemorrhage while 8 (40%) died of complications of hypertensive disorder sequele. (Table 5).

Table 5: Cause of Mortality

Diagnosis	Number of Patients
Obstetric hemorrhage with mods	7
Eclampsia/preclampsia	5
Cardiac failure due to PIH	3
Amniotic fluid embolism	2
Obstructive labour with sepsis and mods	1

In our study, out of 23804 obstetric admissions during the study period, a total of 305 patients were admitted to ICU with admission rate of 1.28% which was comparable to 1.84% in Panda SR *et al.* study[6] 1.49% in Mufti AH *et al.* study[7] and 2.7% in Pollock *et al.* study[8].

In our study, 42.47% had obstetric cause as provisional diagnosis with 38.08% cases of obstetric hemorrhage. In Gupta H *et al.* study[9], 47.5% had obstetric hemorrhage as cause of admission whereas in study by Togal[10], the main primary diagnosis for ICU admission was pregnancy induced hypertension.

Among obstetric causes, obstetric hemorrhage was seen in 38.08% cases followed by hypertensive disorders of pregnancy in 29.77% cases and sepsis in 17.93% cases in our study while in Mufti AH *et al.* study[7], majority of patients had provisional diagnosis of severe preeclampsia/eclampsia in 34.8% which was followed by PPH in 17% and adherent placenta in 13.5%. In Panda SR *et al.* study[6], obstetric hemorrhage was found to be the most frequent clinical diagnosis leading to ICU admission 31.5% followed by hypertensive disorders in 25%.

In our study, among the non-obstetric causes, anemia was prevalent in 7.2% followed by epilepsy in 3.9%, cardiac disorders in 1.3% and others (like CKD, ARF, ARDS, Diabetes) in 1.3% cases. In a study by Farr[11], 4.9% women presented with pre-existing medical conditions during pregnancy. Multiple comorbidities were reported in 20.6% of women with pre-existing medical conditions including hypertensive disorders in 6.3%, congenital heart disease in 6.3%, rheumatic disease in 4.2%, diabetes in 5% and bronchial asthma in 1.7%.

In our study as intervention, 84.59% patients required blood or blood product transfusion followed by 35.08% requiring mechanical ventilation, 20% requiring ianotropic support and 5.25% requiring renal dialysis. In Gupta H *et al.* study[9], 83.5% required blood or blood products transfusion, 50.39% required ianotropic support, 38.58% required mechanical ventilation and 8.66% required dialysis.

Out of 20 patients died in our study, 7 (35%) died of complications of obstetrics hemorrhage while 8 (40%) died of complications of hypertensive disorder sequele. In Gupta H *et al.* study[9], out of 10 died patients, 4 died

of intrauterine death with sepsis followed by 3 patients died of PPH and its sequel. In Mufti AH *et al.* study[7], the prime cause was obstetric haemorrhage followed by severe pre-eclampsia/eclampsia among total 5 deaths.

CONCLUSION

The data revealed that ICU admissions is common in old age (>30years), multigravidae with caesareans as a more common mode of delivery. The leading cause of admission was obstetrics hemorrhage followed by hypertensive disorders of pregnancy as the major cause of admission. The majority of patients required blood or blood products transfusions, mechanical ventilation, vasopressors Notably, the majority died of complications of obstetrics hemorrhage while followed by complications of hypertensive disorder sequele.

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Conflict of Interest: None declared.

Ethical approval: The study was approved by the Institutional Ethics Committee.

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