

**Navigating Obstetric Challenges: Insights from Tertiary Care ICU Admissions****Soubhagya Kumar Das<sup>1</sup>, Satyajit Jena<sup>2</sup>, Sumanta Kumar Dansana<sup>3</sup>, Pramoda Kumar Sahoo<sup>4</sup>**<sup>1</sup>Assistant Professor, Department of Anaesthesiology, SCB Medical College, Cuttack<sup>2</sup>Assistant Professor, Department of O & G, SCB Medical College, Cuttack<sup>3</sup>Assistant Professor, Department of Anaesthesiology, SCB Medical College, Cuttack<sup>4</sup>Assistant Professor, Department of O & G, SCB Medical College, Cuttack

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Corresponding author: Dr. Pramoda Kumar Sahoo

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**Abstract:****Background:** The number of pregnant women admitted to the intensive care unit (ICU) is growing due to variables such as increased maternal age, rising rates and levels of obesity, and other comorbidities. The current research was conducted to examine the admission rate, outcome, and trends in women needing peripartum ICU care.**Methods:** This 6-month retrospective analysis looked at peripartum hospitalizations to the obstetric ICU. Demographics, comorbidities, diagnosis, intensive care unit treatment, duration of stay, and outcome were all examined.**Result:** Out of 7489 births throughout the research period, 112 patients were hospitalized to the intensive care unit. Thus, in our research, the rate of ICU admission was 1.49%. The majority of the patients (37.5%) were between the ages of 31 and 35 and were multigravida (83.9%). Severe pre-eclampsia and eclampsia (77.7%) were the most prevalent diagnoses at the time of ICU admission. 47.5% of patients needed mechanical ventilation. The majority of patients (51.8%) were admitted for a brief (3-day) stay. During the study period, mortality was 4.5%.**Conclusions:** In obstetric critical care units, a multidisciplinary team approach including an obstetrician and an intensivist is suitable. The establishment of obstetric intermediate care units may help to alleviate the stress. In addition to appropriate prenatal care, prompt referral, health education, and health professional training may enhance clinical outcomes and obstetric practice, particularly in low-income countries like India.

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**Introduction**

Every pregnancy is unique and involves its own set of dangers. Because of the significant physiological changes that occur during pregnancy, obstetric medicine differs from general medicine. The circulatory, endocrine, urinary, and respiratory systems are all affected by the physiological changes that occur during pregnancy. These alterations may result in severe pregnancy-related problems, with negative effects for both the pregnant mother and the baby. [1]

During pregnancy and delivery, the vast majority of women stay healthy. A tiny proportion of women become critically ill during pregnancy or delivery and need critical care. [2] Nonetheless, the number of women who get ill around the time of delivery has increased owing to variables such as increasing maternal age, rising rates and levels of obesity, and other comorbidities. [3] An admission to the Intensive Care Unit (ICU) might be scheduled,

such as for maternal congenital heart disease, or it can be emergency, such as for postpartum hemorrhage or severe respiratory failure. Women who get extremely ill during pregnancy, labor, or the postoperative period should be evaluated.

Regardless of location, patients have instant access to critical care of the same quality as other ill patients. The American College of Obstetrics and Gynecology has recently recognized ICU admission as a measure of severe maternal morbidity. [4] ICU hospitalization for obstetric patients remains uncommon in high-income nations, accounting for fewer than 1% of all ICU admissions. [5,6] In underdeveloped nations, the number is greater, with admission rates as high as 7% in India, and the maternal mortality ratio is also much higher. [7] Obstetric ICU admissions are an indirect predictor of maternal morbidity and death. Critical care in obstetrics has been characterized as

"the specialized management of critically-ill obstetric patients via an interdisciplinary approach in which the optimization of the clinical variables of pregnant women should be approximated to the maternal-fetal unit needs as a whole" Given the small number of pregnant women admitted to the ICU, expertise on the best way to handle critically sick pregnant moms is limited. [8]

Because any pregnant woman might become critically ill, intensive care physicians and obstetric anaesthetists must be trained in the resuscitation and stabilization of unwell pregnant women. A multidisciplinary strategy with sufficient risk assessment before to pregnancy, early registration for delivery, and ongoing prenatal care may assist to lower obstetric ICU admission rate in contemporary obstetrical care.

### Methods

Retrospective observational research was conducted at SCB Medical college, Cuttack, India. The research lasted six months, from January to June of 2020. After gaining institutional ethical approval, all consecutive patients hospitalized to the obstetric ICU throughout this time period were included in this research. Demographic information, obstetric and medical history, tentative diagnosis, and ICU treatments (monitoring alone, ventilator support) are all gathered. All of the patients in the research were followed up on to see how they fared in the ICU. The duration of stay in the ICU and any death in the ICU were documented as outcome measures.

### Results

This 6-month retrospective observational research was carried out from January to June 2020. During

the research period, 112 patients were admitted to ICU out of 7489 births. Thus, in our research, the rate of ICU admission was 1.49%. The age group 31-35 years (37.5%) had the most patients, followed by 25-30 years (33.9%). 11.6% of the study population was above 35 years old.

Only 16.1% of patients were primigravida, whereas 83.9% were multigravida.

In the majority of the study population, the provisional diagnosis upon admission to the obstetrical ICU was pregnancy-related. The most common diagnosis was severe pre-eclampsia/eclampsia (34.8%), followed by PPH (17%), adherent placenta (13.5%), severe anaemia (7.2%), and placental abruption (4.4%).

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Congenital cardiac disease and pulmonary edema were found in 4.4% of the population. Ectopic pregnancy and uterine rupture were also seen. Acute fatty liver of pregnancy, epilepsy, and allergy were also documented as rare causes. 47.3% of patients needed ventilator assistance, while 52.7% were hospitalized for observation. The majority of the study population, 51.8%, was admitted for a brief stay (3 days). 88.4% of patients recovered and were released, while 7.1% were transferred to the general ICU due to the requirement for continued ventilatory support. In our research, the maternal death rate was 4.5%

**Table 1: ICU admissions**

| ICU admission           | No. of patients |
|-------------------------|-----------------|
| Total deliveries        | 7489            |
| Total ICU admissions    | 112             |
| % age Of ICU admissions | 1.49%           |

**Table 2: Age distribution**

| Age in years | No. of patients | %    |
|--------------|-----------------|------|
| <25          | 19              | 17.0 |
| 25-30        | 38              | 33.9 |
| 31-35        | 42              | 37.5 |
| >35          | 13              | 11.6 |

**Table 3: Parity**

| Parity       | No. of patients | %    |
|--------------|-----------------|------|
| Primigravida | 18              | 16.1 |
| Multigravida | 94              | 83.9 |

**Table 4: Gestational period at admission**

| Period of gestation(weeks) | No. of patients | % |
|----------------------------|-----------------|---|
|----------------------------|-----------------|---|

|             |    |      |
|-------------|----|------|
| <13         | 7  | 6.3  |
| 13-28       | 10 | 8.9  |
| >28         | 87 | 77.7 |
| Post-partum | 8  | 7.1  |

**Table 5: Provisional diagnosis**

| Diagnosis                       | No. of patients | %    |
|---------------------------------|-----------------|------|
| Severe pre- eclampsia/eclampsia | 39              | 34.8 |
| PPH                             | 19              | 17   |
| Placenta accreta/percreta       | 15              | 13.5 |
| Severe anaemia with CCF         | 8               | 7.2  |
| Abruption                       | 5               | 4.4  |
| Pulmonary edema                 | 5               | 4.4  |
| Congenital heart disease        | 5               | 4.4  |
| Sepsis                          | 5               | 4.4  |
| Rupture ectopic                 | 4               | 3.6  |
| Rupture uterus                  | 3               | 2.7  |
| Epilepsy                        | 2               | 1.8  |
| Anaphylaxis                     | 1               | 0.9  |
| Acute fatty liver ofpregnancy   | 1               | 0.9  |

**Table 6: ICU care required.**

| ICU care required  | No. of patients | %    |
|--------------------|-----------------|------|
| Ventilator support | 53              | 47.3 |
| For monitoring     | 59              | 52.7 |

**Table 7: Length of stay in ICU**

| No. of days in ICU | No. of patients | %    |
|--------------------|-----------------|------|
| <3                 | 58              | 51.8 |
| 3-7                | 45              | 40.2 |
| >7                 | 9               | 8    |

**Table 8: Outcome in ICU**

| Outcome   | No. of patients | %    |
|-----------|-----------------|------|
| Recovered | 99              | 88.4 |
| Shifted   | 8               | 7.1  |
| Death     | 5               | 4.5  |

## Discussion

Obstetric ICU admissions are on the rise these days as a result of variables such as advanced maternal age, related co-morbidities, and obesity. Out of 7849 births throughout the research period, 112 were admitted to the obstetric ICU, resulting in an ICU admission rate of 1.49% in our study.

Pollock et colleagues observed a 2.7 per 1000 births overall rate of obstetric ICU hospitalization.9 The admission rate in a research conducted by Farr et al was 6.4 per 1000 deliveries, equal to 1 admission every 156 deliveries. [10] Previous research claim an ICU admission rate ranging from 0.1 to 1.7%, whereas other studies estimate an admission rate of 3.3%. [11-15]

The majority of patients in our research group, 71.4%, were between the ages of 25 and 35. Panda et al reported similar findings in their research, where 73.9% of patients were between the ages of 20 and 35. [16]

Maternal age seems to be connected with a higher risk of obstetric ICU hospitalization. Increased maternal age has been linked to hypertensive disorders of pregnancy, eclampsia, placental difficulties, and maternal mortality, according to Bhadade et al. and Cleary Goldman et al. [17,18]

The majority of patients (83.9%) were multigravida and came to the obstetric ICU in their third trimester, i.e. 77.7%. Farr et al.[10,19] and Joseph et al.10,19 both reported similar findings.

The majority of patients in our research (34.8%) received a preliminary diagnosis of severe pre-eclampsia/eclampsia, followed by PPH (17%) and abnormally adherent placentae (13.5%). In our research, obstetric heamorrhage was a strong risk factor for ICU hospitalization. Joseph et al found similar findings in their investigation. [19] Other reasons for obstetric ICU stay included severe anaemia, placental abruption, and pulmonary edema. Some patients had pre-existing problems, such as congenital heart disease. Ectopic pregnancy and uterine rupture were also seen. Acute fatty liver

of pregnancy and anaphylaxis were also mentioned as rare disorders. As a result, obstetric problems were the most common reason for ICU admission.

The majority of patients stayed in the ICU for three days and needed monitoring for recovery. This highlights the need of an obstetric intermediate care unit in order to reduce the load of an obstetric ICU.

The majority of patients in our research recovered (88.4%), while 7.1% were transferred to a medical ICU due to a prolonged requirement for mechanical breathing. In our research, the maternal death rate was 4.5%, which was lower than the national average. The most common cause of mortality in our research was obstetric hemorrhage, followed by severe pre-eclampsia/eclampsia. This might be attributed to inadequate prenatal care, anaemic multiparous individuals, and delayed admission to a tertiary care institution.

### Conclusion

Obstetric ICU admissions are increasing these days. When compared to the nonpregnant population, the insult threshold needed for ICU admission in obstetric patients is low. In obstetric critical care settings, a multidisciplinary team approach including an obstetrician and intensivist is acceptable. The establishment of obstetric intermediate care units may help to alleviate the stress. In addition to appropriate prenatal care, prompt referral, health education, and health professional training may enhance clinical outcomes and obstetric practice, particularly in low-income countries like India.

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