

## Research Article



## Evaluation of Obstetric Admissions to Intensive Care Unit (ICU) of a Tertiary Care Indian Teaching Hospital

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### ABSTRACT

The need for critical care support and admission to ICU in obstetric patients is relatively infrequent, as they are usually a young and healthy group of patients. Management of pregnant patients with medical complications requires a multidisciplinary team involvement. A significant proportion of maternal deaths in developing countries are due to massive blood loss, pre-eclampsia, or pre-existing heart disease. Such types of patients are suitable for management in intensive care units (ICU). The aim is to review the indications for admissions, demographics, interventions and outcomes of patients admitted to the ICU of our institution. A prospective study to evaluate obstetric ICU admissions both antenatal and postnatal from September 2013 to March 2015 in a tertiary care hospital. Twenty five women were admitted to the ICU. The total number of deliveries during the study period was 2566. Hypertensive spectrum of diseases were the most common indication (28%) for admission to the ICU followed by obstetric haemorrhage and cardiac disorders. 64% of the patients were referred to our institution from other hospitals for tertiary care. 24% patients admitted to the ICU required mechanical ventilation. (n= 6). There were three maternal deaths during the study period. Hypertensive spectrums of disorders were the most common indication for ICU admission followed by obstetric haemorrhage. A multidisciplinary team involvement is essential in the management of these patients. The full scope of ICU resources should be immediately available to the obstetric patients when the need arises.

**Keywords:** Intensive care unit, obstetric admissions, mortality, eclampsia and preeclampsia, obstetric haemorrhage.

### INTRODUCTION

Obstetric admissions to the ICU and maternal mortality have a significant impact on maternal health care despite ongoing improvements in obstetric care. Care of the critically ill pregnant women presents a unique challenge as the assessment, monitoring and the treatment must take into account both maternal and foetal wellbeing. The incidence of admission of obstetric patients to the ICU is approximately 0.1%-0.9 %.<sup>1</sup> Obstetric patients are young and otherwise healthy. But their management is challenged by concerns for foetal viability, altered maternal physiology, and diseases specific to pregnancy.<sup>2</sup> Management of these patients requires a multidisciplinary team approach which involves anaesthesiologists, obstetricians and the ICU team. Critically ill obstetric patients constitute a small proportion of ICU admissions (<2%). In India the figure is as high as 7%. This study attempts at evaluating the occurrences, indications, interventions and outcomes of obstetric patients admitted to the ICU of our institution.

### MATERIALS AND METHODS

This prospective study was conducted in IMS & SUM Hospital, the medical school of the Siksha O Anusandhan situated in Bhubaneswar from September 2013 to March 2015 over a period of 18 months. This is a 750 bedded tertiary care centre with 25 intensive care beds with no obstetric ICU. The Unit has facilities for ventilator

support, non-invasive cardiovascular monitoring and is close to a dialysis unit. The data collected included the age of the patient, the parity, and indications for ICU admissions, interventions, maternal outcome and the duration of ICU stay. All the parturient and 42 day postpartum patients admitted to the ICU in the study period were included in the study.

### RESULTS

A total of 25 –obstetric patients were admitted in ICU from September 1, 2013 to 31st march 2015. This represented 0.97 percent of deliveries during this time, an incidence of 9.7 obstetric admissions per 1000 deliveries. The total number of deliveries during this period was 2566. These admissions included patients who were admitted to the department of obstetrics and gynaecology for antenatal complications- abortion and its complications, ectopic pregnancy, obstetric haemorrhage, and complications of the puerperium. The majority of the patients were admitted to the ICU post-partum (n=17, 68%). The most common mode of delivery was emergency caesarean section. The age of the patients ranged from 21-40 years of age and the majority of the patients were between the ages of 20 and 30 years. The mean maternal age was 24.02 years. Fifteen patients (60%) were multiparous. Rest ten patients were primiparous (40%). Approximately 24 % of women had no antenatal check-up and this lack of antenatal care was also found to be significantly associated with higher risk



of mortality. 64% of the patients were referred to our institution from other hospitals for tertiary care.

Overall the most common indication of ICU admission was hypertensive spectrum of diseases (n=7, 28%). Three out of 7 patients were admitted with eclamptic seizures and altered sensorium. Four patients required ventilator support. Two patient of eclampsia developed HELLP syndrome. Two patients developed renal impairment and renal replacement therapy was initiated in both the patients.

Obstetric haemorrhage and cardiac disorders were the second common obstetric causes of admissions (n=5, 20%). Hysterectomy was performed in three patients of obstetric haemorrhage as a lifesaving method where bleeding could not be controlled. Puerperal sepsis accounted for 16% of the cases.

24% patients admitted to the ICU required mechanical ventilation. (n= 6). Transfusion of red cells was needed in 56% of patients (n=14). They needed between five to ten units of blood. 13 patients stayed for less than 48 hours (52%). Five patients (20%) stayed for 10-15 days. Rest of the patients had ICU requirement for 3-5 days. Mean length of ICU stay was 4.12 days. The longer duration of ICU stay would reflect the severity of the patient's clinical situation.

There were three maternal deaths during the study period (12%). Two deaths were due to eclampsia. One death in case of eclampsia was due to Hepatic coma and the other was due to pulmonary oedema. One patient died due to massive haemorrhage due to placenta accreta.

**Table 1:** Age distribution of the patients transferred to ICU

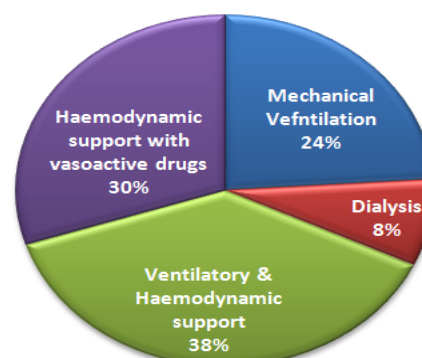
Age distribution (in year)	No. of patients	%
< 20	8	32
21-25	9	36
26-30	3	12
31-35	3	12
36-40	2	8

**Table 2:** Causes of ICU admission

Underlying Causes	No. of patients	%
Obstetric haemorrhage	5	20
Hypertensive disorders	7	28
Cardiac disorders	5	20
Puerperal Sepsis	4	16
Ectopic Pregnancy	4	16

**Table 3:** Causes of Maternal Mortality in ICU

Causes	Number	%
Hypertensive Disorders	2	8
Haemorrhage	1	4



**Interventions in ICU**

## DISCUSSION

Admission to an intensive care unit is considered an objective marker of severe maternal morbidity. Pregnancy, delivery and puerperium can be complicated by maternal morbidity necessitating intensive care unit admissions. A total of 25 patients were admitted to the ICU during the study period. Obstetric admissions represented 0.97% of the total deliveries which is comparable to studies done by other authors. A study conducted by Ghike<sup>3</sup> found that the total obstetric patients who needed ICU admissions were 1.04% of all deliveries. Poornima<sup>4</sup> found that ICU admissions constituted 0.39% of all deliveries. Similarly Lataifeh<sup>5</sup> found that the ICU admissions represented 0.37% of all deliveries. But in a study by Niyaz<sup>2</sup> obstetric admissions represented 11.6% of total admissions which is quite high as compared to our study. A study done by Upadhyay<sup>6</sup> showed an ICU admission rate of 2.3% of all deliveries. 64% of the patients in our study were referred from peripheral health centres ill-equipped to manage obstetric emergencies.

Majority of the patients (68%) were admitted to the ICU in the post-partum period, which is similar to the study by Lataifeh.<sup>5</sup> In some studies<sup>7</sup>, all patients admitted to ICU were post-partum. In other studies conducted 22.8% were antepartum and 74.1% were postpartum.<sup>8,9</sup>

The most common reason for admission to ICU was hypertensive spectrum of diseases (pre-eclampsia and eclampsia). It represented 28% of all deliveries which is comparable to other studies.

Studies done by Lataifeh<sup>5</sup>, Niyaz<sup>2</sup>, Ghike<sup>3</sup> found that hypertensive spectrum of diseases were the most common indications for ICU admissions. Pre-eclampsia was the major reason for ICU admission in a study done by Chawla<sup>10</sup> and Keizer.<sup>11</sup>

Obstetric haemorrhage (20%) and cardiac disorders (20%) were the second most common cause for ICU admissions.

In a study by Lataifeh<sup>5</sup>, Chawla<sup>10</sup> obstetric haemorrhage was the second most common cause for ICU admission. This is in contrast with other studies<sup>2,4,12</sup> where obstetric haemorrhage was the most common indication for ICU admission. Sepsis accounted for 16% of ICU admissions in our study which is similar to the findings in a study done by Chawla<sup>9</sup> and Bibi.<sup>13</sup> Whereas Osinaike<sup>14</sup> in their study found that 8% of the patients presented with sepsis which is in contrast to our study. Infections are responsible for 15% of maternal morbidity and mortality worldwide.<sup>14</sup>

Ventilatory and hemodynamic support was required in 24% of the patients which is almost similar to a study by Lataifeh<sup>5</sup> in which mechanical ventilation was required to support 18.6% of the patients. Niyaz<sup>2</sup> in their study showed a higher rate of mechanical ventilation (85%). Blood and blood products transfusion was one of the major components of ICU care. 56% patients (n=12) needed between five to ten units.

There were three maternal deaths during the study period (12%). Two of the three deaths were due to eclampsia and one was due to postpartum haemorrhage. One death in case of eclampsia was due to Hepatic coma and the other was due to pulmonary oedema. One patient died due to massive haemorrhage due to placenta accreta. Saif<sup>12</sup> in their study reported sepsis as the most common cause of maternal death. The major cause of higher mortality due to sepsis in developing countries is higher prevalence of septic abortions. The risk factors for mortality in this study were organ dysfunction on admission, massive blood loss and late presentation. Maternal mortality has been reported to be high in some studies<sup>3,7</sup>. Lataief<sup>5</sup> showed a maternal death rate of 6.9%. The maternal death rate of 13% in a study by Niyaz<sup>2</sup> was almost similar to the findings in our study. Maternal mortality rate is significantly higher in developing countries (8-40%), compared to that in developed countries (0.1-3.4%).<sup>9</sup> A systematic review conducted by WHO found that postpartum haemorrhage is the leading cause of maternal mortality in Africa and Asia.<sup>15</sup> On the whole postpartum haemorrhage accounts for 25% of maternal mortality worldwide.<sup>16</sup> It is found that about 72% of maternal deaths can be prevented through effective antenatal care. Since most obstetric emergencies are not predictable and 15% of all pregnant women develop life-threatening complications, antenatal care will not prevent all the maternal deaths. Thus, it is the combination of antenatal care and intensive obstetric care that is essential for reducing maternal mortality.<sup>17</sup>

## CONCLUSION

The incidence of obstetric ICU admissions was 9.7 per 1000 deliveries. Hypertensive spectrums of diseases were the major cause of admissions to the ICU. A multidisciplinary team involvement is essential in the management of pregnancy-induced hypertensive

disorders and obstetric haemorrhage, as they are the most common causes of maternal mortality and morbidity. Early recognition of high risk cases and appropriate referral may improve the clinical outcome.

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