



## EVALUATION OF OBSTETRIC ADMISSIONS TO INTENSIVE CARE UNIT(ICU) OF A TERTIARY CARE INDIAN TEACHING HOSPITAL

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**ABSTRACT** **Background:** There are huge variations in the indications of ICU admissions, mortality and morbidity rates as well as the demographic characteristics. The commonest indication intensive care unit admission of obstetric patients is haemorrhage, both antepartum and postpartum. They need intensive management involving a multidisciplinary team involving the cardiologists, haematologists, nephrologists, pulmonologists and gastroenterologists as and when required. Hypertensive disorders of pregnancy and its related complications are also major contributory factors admissions to ICU.

**Material and methods** A retrospective study to evaluate obstetric ICU admissions both antenatal and postnatal from January 2009-December 2016 over a period of 8 years.

**Results** Ninety women with obstetric complications were admitted to the ICU. The total number of deliveries during the study period was 13732. Obstetric haemorrhage was the most common indication (45.5%) for admission to the ICU followed by hypertensive spectrum of diseases (26.6%) and cardiac disorders accounted for 15.5% of cases. 64% of the patients were referred to our institution from other hospitals for tertiary care. 31.1% patients admitted to the ICU required mechanical ventilation. (n=28). There were fourteen maternal deaths during the study period (15.5%).

**Conclusion** Obstetric haemorrhage was the most common indication for ICU admission followed by hypertensive spectrum of disorders. Maternal mortality was 15.5% in this study. Obstetric haemorrhage was the most important cause of maternal deaths (45.5%).

**KEYWORDS :** Obstetric haemorrhage, hypertensive disorders, mortality, post-partum, emergencies.

### INTRODUCTION:

The incidence of admission of obstetric patients to the ICU is approximately 0.1%-0.9%<sup>1</sup>. Obstetric emergencies pose a challenge to the obstetricians and they need intensive management involving a multidisciplinary team. Such type of emergencies are better managed in an obstetric intensive care unit where there are facilities for consultation with the cardiologists, haematologists, nephrologists, pulmonologists and gastroenterologists as and when required.

Critically ill obstetric patients who need ICU admissions is as high as 7% in India. This incidence varies from country to country. In developed countries the incidence of obstetric admissions ranges from 0.08 to 0.76% of deliveries<sup>2-6</sup> whereas in developing countries it ranges from 0 to 4.6%<sup>7-14</sup>. This study was undertaken in order to evaluate the occurrences, indications, interventions and outcomes of obstetric patients admitted to the ICU of our institution.

### MATERIAL AND METHODS

This is a retrospective study conducted in the department of O&G of the institute of medical college & SUM hospital of the Siksha O Anusandhan University situated in Bhubaneswar from January 2009-December 2016 over a period of 8 years. The age of the patient, the parity, and indications for ICU admissions, interventions, and maternal outcome were collected and analysed. The causes of maternal mortality were noted. All the particulars were collected from the ICU register and the case records of the patients were studied in detail. The total duration of hospital stay was also noted. All the antepartum and postpartum patients admitted to the ICU in the study period were included in the study.

### RESULTS

A total of 90 obstetric patients were admitted in ICU during the study period. This represented 0.65 percent of deliveries during this time, an incidence of 6.5 percent obstetric admissions per 1000 deliveries. The total number of deliveries during this period were 13732. The majority of the patients were admitted to the ICU post-partum (n=62, 68.8%) (Table 1). The most common mode of delivery was emergency caesarean section. The majority of the patients were between the ages of 20 and 30 years (n=61, 67.7%) (Table 1). The mean maternal age was 30 years. Fifty one patients (56.6%) were multiparous. The remaining thirty-nine patients were primiparous (43.3%). Majority of the patients

were referred to our institution from other hospitals for tertiary care.

Overall the most common indication of ICU admission was obstetrical haemorrhage (n=41, 45.5%) (Table 2). Hysterectomy was performed in three patients of obstetric haemorrhage as a lifesaving method where bleeding could not be controlled. Hypertensive spectrum of diseases accounted for 26.6% (n=24) (Table 2). Thirteen out of the 24 patients were admitted with eclamptic seizures and altered sensorium. Four patients of eclampsia developed HELLP syndrome. Ten patients developed renal impairment and dialysis was initiated in these cases. Cardiac disorders accounted for 15.5% of the cases and puerperal sepsis accounted for 12.2% of the cases (Table 2).

There 31.1% patients admitted to the ICU required mechanical ventilation. (n=28) (Table 3). Transfusion of red cells was needed in 24.4% of patients (n=22). They needed between three to seven units of blood. The number of cases who required dialysis was 11.1% (n=10) (Table 3). 46 patients stayed for less than 48 hours (51%). 18 patients (20%) stayed for 10-15 days. Rest of the patients (n=26) had ICU requirement for 3-5 days (Table 5). The severity of the patient's clinical situation is reflected by the longer duration of ICU stay.

There were fourteen maternal deaths during the study period (15.5%). Obstetric haemorrhage accounted for 64.2% of maternal deaths. Three deaths were due to hypertensive disorders of pregnancy. The cause of death due to hypertensive disorders were hepatic coma, pulmonary oedema and HELLP syndrome. There were two deaths due to sepsis accounting to 14.2% of cases.

### DISCUSSION

A total of 90 patients were admitted to the ICU during the study period. This represents 0.65 percent of all deliveries during this time, an incidence of 6.5 percent obstetric admissions per 1000 deliveries. This rate was almost similar to studies done by other authors<sup>2,5, and 6</sup>. But this rate is lower compared to some other studies<sup>3, 7</sup>. In the present study post-partum admissions accounted for 62%. Several other studies have also reported a majority of postpartum admissions<sup>15,16,17,18</sup>. Several other studies have reported a majority of antepartum admissions<sup>12, 19</sup> and admissions on the delivery<sup>3,20</sup>.

The most common reason for admission to ICU was obstetric

haemorrhage. It represented 45.5% of all deliveries which is comparable to other studies<sup>2, 6, 13, 21</sup>. Some studies<sup>15, 19, 22</sup> found that hypertensive spectrum of diseases were the most common indications for ICU admissions. Chawla et al<sup>23</sup> and Keizer et al<sup>24</sup> in their studies found pre-eclampsia as the major cause for ICU admissions.

Hypertensive disorders were the second most common cause for ICU admissions in our study accounting for 26.6% cases. Obstetric haemorrhage was the second most common cause for ICU admission in some studies<sup>15, 23</sup>. The other major conditions were cardiac disorders (15.5%) and sepsis (12.2%). A study by Small MJ<sup>25</sup> reported cardiac dysfunction as the commonest cause in 36% cases. Mirghami et al<sup>21</sup> reported a high percentage of cardiac disease as compared to our study (21.6%). In some studies the percentage of cardiac disease ranged from 3.5 to 18.3<sup>3,4,5,7</sup>. Sepsis accounted for 12.2% of ICU admissions in our study which is similar to the findings in a study done by certain authors<sup>23, 26</sup>, whereas Yuel et al reported a higher incidence of sepsis in about 30.9% cases<sup>12</sup>. Sepsis has been reported to be in the range of 2.4 to 18.3% in some studies<sup>9,12,27,28,29</sup>.

Ventilatory and hemodynamic support was required in 31.1% of the patients. The rate of mechanical ventilation was as high as 85% in a study by Niyaz et al<sup>19</sup>. 24.4% patients (n=22) needed between three to seven units. Invasive monitoring is essential in majority of the critically ill patients during their ICU stay. There are huge variations in the indications of ICU admissions, mortality and morbidity rates as well as the demographic characteristics.

There were fourteen maternal deaths during the study period (15.5%). The maternal death rate of 15.5% in a study by Rathod et al<sup>30</sup> was almost similar to the findings in our study. Obstetric haemorrhage accounted for 64.2% of maternal deaths. There were two deaths due to sepsis accounting to 14.2% of cases. Saif et al<sup>31</sup> reported Sepsis as the most common cause of maternal mortality. Maternal mortality has been reported to be high in some studies<sup>16,22</sup>. Mortality in this study is high compared to other studies<sup>4,6,9,13,24,27,28,32</sup>. It was low as compared to other studies<sup>11,12,14,33</sup>. Studies in literature have reported that presence of a HDU is known to reduce the number of ICU admissions by 53% thus making ICU beds available to more needy women well in time<sup>34</sup>.

**CONCLUSION**

The incidence of obstetric ICU admissions was 6.5 per 1000 deliveries. In the present study, most common obstetric reasons for ICU admission were massive obstetric haemorrhage and hypertensive disorders. There is a need for the availability of a High Dependency Unit (HDU) where severe acute maternal morbidity (SAMM) cases can be managed. HDU serves as a level of care between general ward and ICU. Presence of a HDU reduces the number of ICU admissions making ICU beds available to more needy women. Early recognition of high risk cases and appropriate referral may improve the clinical outcome.

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

Age distribution (in year)	Number of cases	%
< 20	12	13.3
20-30	61	67.7
>31	17	18.8
Parity		
Primi	39	43.3
Multi	51	56.6
Gestational Age at the time of admission		
Antepartum	28	31.5
Post-partum	62	68.8

**TABLE-2: Causes of ICU admission**

Underlying Causes	Number of cases	%
Obstetric haemorrhage	41	45.5
Hypertensive disorders	24	26.6
Cardiac disorders	14	15.5
Puerperal Sepsis	11	12.2

**TABLE-3: ICU intervention**

Procedure	Number of cases	%
Ionotrops	30	33.3

Mechanical ventilation	28	31.1
Blood or blood product transfusion	22	24.4
dialysis	10	11.1

**TABLE- 4: Causes of Maternal Mortality in ICU**

Causes	Number of cases	%
Hypertensive Disorders	3	21.4
Haemorrhage	9	64.2
Sepsis	2	14.2

**TABLE- 5: Duration of hospital stay**

Number of days	Number of cases	%
< 48 hours	46	51
3-5 days	26	29
10-15 days	18	20

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