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Original research article

Study of obstetric admission to the intensive care unit of a tertiary care hospital in western part of India

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Abstract

Background: Obstetric ICU admission is on rise in pregnant women due to factors including increasing maternal age, increasing rates and levels of obesity and other co-morbidities. The present study was done to analyze admission rate, outcome and trends in women requiring peripartum admission to ICU.
Method: It is a retrospective observational study of obstetrics intensive care unit admission over a period of 1 year. Demographic characteristics, risk factors, ICU management and outcome were analyzed.
Result: Out of 1726 deliveries during the study period, a total of 88 patients were admitted to ICU. Thus the rate of ICU admission in our study was 5.09%. Severe pre-eclampsia, post-partum hemorrhage, eclampsia was most common diagnosis at the time of ICU admission. Mortality during study period was 5.6%.
Conclusion: There has to be Multidisciplinary team approach for Management including Obstetrician and Intensivist for critical care requiring patients. Good Antenatal care, Screening of high-risk patient, timely referral and primary ICU Training to all Healthcare professionals may improve Clinical outcome and Better Management of these critically ill obstetric patients and can help to reduce maternal Morbidity and Mortality in developing countries.
Keywords: Intensive care unit, outcome, maternal mortality

Introduction

Obstetric emergencies are challenging because of unique nature of obstetric medicine. Physiological changes occurring during pregnancy may lead to rapid worsening of preexisting comorbidity or develop major complications without prior warning signs and even leading to maternal death. The majority of such deaths can be prevented if these complications are managed timely referred to tertiary care with providing quality of critical care by obstetricians with the help of EMD doctors and anesthetist as a multidisciplinary approach.

It is of utmost importance that pregnant women at risk must be identified and managed appropriately. Maternal near miss is defined as "a woman who nearly died but survived complications that occurred during pregnancy, childbirth or within 42 days of pregnancy [1]. Therefore, a clear comprehension and evaluation of patients diagnosed with near miss will undoubtedly help to decrease and /or prevent maternal mortality.

Material and Method

It is a retrospective observational study of obstetrics intensive care unit admission over a period of 1 year from February 2023 to January 2024 at SVP Hospital Ahmedabad, India. All pregnant and postpartum

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(<42 days) admitted to ICU were included in study. We used data collected retrospectively from an ICU database of obstetrics patients who were admitted to obstetrics ICU after institutional ethical committee approval. We collected baseline demographics including Age, Parity, Gestational age and associated risk factors for ICU admission were noted and ICU intervention in terms of mechanical ventilation and other support were recorded. The patients were followed up till discharge from hospital or till death whatever occurred first. Primary outcome was incidence of risk factor for admission and its supportive management, secondary to study mortality rate after ICU management.

Results

Table 1: ICU admission

Total deliveries	1726
Total ICU admission	88
Percentage of ICU admission	5.09%

This retrospective observational study was conducted for a period of 1 year from February 2023 to January 2024. Out of 1726 deliveries during study period a total of 88 patients were admitted in obstetrics ICU, Thus the rate of ICU admission in our study was 5.09%.

Table 2: Demographic characteristics

Table 2A: Age distribution

Age in year	No. of patients	Percentage
<25	19	21.5%
25-30	37	42.0%
31-35	22	25.0%
>35	10	11.3%

Table 2B: Parity

Parity	No. of patient	Percentage
Primi	21	23.8%
Multi	67	76.1%

Table 2C: Gestational age at admission

Gestational age	No. of patient	Percentage
<28 weeks	6	6.8%
>28 weeks	75	85.2%
Postpartum	7	7.9%

Maximum patients were in age group 25-30 year (42.0%) followed by 31-35 year (25.0%), >35 years comprised 11.3% of study population.
Majority of patients were multigravida (76.1%) and presented in third trimester of pregnancy and 7.9% patients presented in their postpartum period.

Table 3: Risk factors

Provisional diagnosis	No of patient	Percentage
Severe preeclampsia	30	34.0%
Postpartum hemorrhage	10	11.3%
Eclampsia	6	6.8%
Placenta Accreta/percreta	6	6.8%
Severe anemia	6	6.8%
Ruptured ectopic	4	4.5%
Diabetes in pregnancy	4	4.5%
Heart diseases	3	3.4%
Liver Disease in Pregnancy	3	3.4%
Gestational Thrombocytopenia	3	3.4%
HELLP syndrome	3	3.4%
Antepartum hemorrhage	2	2.2%
Epilepsy	2	2.2%
Puerperal sepsis	1	1.1%
Post D&E complications	1	1.1%
Hyperemesis Gravidarum	1	1.1%
Meningitis	1	1.1%
Dengue Hemorrhagic Fever	1	1.1%
Anaphylaxis	1	1.1%

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The main reason for ICU admission in our study was severe pre-eclampsia in 34.0% followed by post-partum hemorrhage found as cause of admission in 11.3% and eclampsia found in 6.8% of patients.
Liver disease in pregnancy, HELLP syndrome, gestational thrombocytopenia, dengue hemorrhagic fever were the other risk factors found in our study.
Rare causes like meningitis, anaphylaxis were also reported.

Table 4A: Mode of delivery

	No of patient	Percentage
LSCS	52	59.0%
Normal delivery	17	19.3%

Table 4B: Other surgical procedure

	Number of Patients	Percentage
Hysterotomy	4	4.5%
obstetrics hysterectomy	4	4.5%
Laparotomy for ectopic pregnancy	3	3.4%
Pelvic hematoma exploration	3	3.4%
Manual removal of placenta	2	2.2%
Uterine packing	1	1.1%
Evacuation of product of conception	1	1.1%
Cervical tear suturing	1	1.1%

Normal delivery was done in 19.3% and LSCS was required in 59.09%, obstetric hysterectomy was done in (4.5%) to save the life of mother in cases of post-partum hemorrhage and placenta percreta.

Table 5: ICU management

	No of patient	Percentage
Monitoring	30	34.0%
Blood and blood component transfusion	28	31.8%
Inotropic support	18	20.4%
Ventilatory support	11	12.5%
Dialysis	1	1.1%

ICU intervention during stay of patients in terms of monitoring in 31.8%, blood and blood product transfusion in 34.09%, inotropic support in 18.0%, ventilatory support in 12.5% cases and dialysis required in 1.1% cases.

Table 6: Outcome of ICU management

Outcome	No of patient	Percentage
Recovered	83	94.3%
Death	05	5.6%

Table 7: Cause of mortality

Cause	No of patient	Percentage
Hemorrhagic shock	2	2.2%
Eclampsia	1	1.1%
HELLP syndrome	1	1.1%
Septic shock	1	1.1%

In our study 94.3% were improved after ICU management while 5.6% mortality rate was found.
Major cause of mortality in our study was hemorrhagic shock (2.27%) other causes of mortality were eclampsia, HELLP syndrome, septic shock.

Discussion

Obstetrics ICU admissions are increasing nowadays owing to factors like advanced maternal age, associated comorbidities and obesity. Majority of maternal deaths occurs in developing countries (99%) [2].

Out of 1726 deliveries during study period 88 were admitted in obstetrics ICU making rate of ICU admission in our study 5.09%. This is comparable with other studies. In a study conducted by Farr *et al*. admission rate was 6.4 per 1000 deliveries [3].

Pollock *et al*. reported an overall incidence of obstetrics ICU admission of 2.7 per 1000 deliveries [4]. Some reports from previous studies show an ICU admission rate that range from 0.1 to 1.7%, while other study show an admission rate of 3.3% [5-9].

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These variations might be due to difference in defining major morbidity criteria for ICU admission and availability of high dependency unit HDU.
In our study a relatively high obstetrics ICU admission might be due to referrals because of our hospital is a tertiary care center.
Majority of patients i.e. 67% in our study group belong to the age group 25-35 year. Similar results were found in a study done by panda *et al*. [10].
Advanced maternal age seems to be associated with increase rate of obstetrics ICU admission. Bhadade *et al*. and cleary Goldman *et al*. found that increased Maternal age is associated with hypertensive disorders of pregnancy, eclampsia, placental problems and maternal mortality [11-12].
76.1% were multi gravida and presented in their third trimester in our study and admitted in obstetrics ICU, similar observations were made in studies done by Farr *et al*. and Joseph *et al*. [3, 13].
In our study majority of patients were of severe pre-eclampsia (34.0%) follow by postpartum hemorrhage 11.3%, eclampsia 6.8%, which were found to be major risk factors associated with ICU admission in our study. Similar results were noted by Joseph *et al*. in their study [13].
94.3% patients in our study were recovered and maternal mortality rate in our study found was 5.6%, which is lower than the national statistics [14]. Among the 5 deaths in our study the prime cause was obstetrics hemorrhage followed by eclampsia and HELLP syndrome. This may be due to poor antenatal care, already anemic multiparous patients and delayed referral to tertiary care center.

Conclusion

Obstetric ICU and HDU in tertiary care hospitals is a must nowadays in this modern era. There has to be a Multidisciplinary team approach for Management including Obstetrician and Intensivist for critical care requiring patients.
Good Antenatal care, Screening of high-risk patient, timely referral and primary ICU Training to all Healthcare professionals may improve Clinical outcome and Better Management of these critically ill obstetric patients and can help to reduce maternal Morbidity and Mortality in developing countries.

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