

Profile of Obstetric Morbidity Among Maternal Intensive Care Unit Patients

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Aims: The objective of the study was to determine the outcome of the obstetric admissions to Maternal Intensive Care Unit in the setting of a tertiary care hospital.

Methods: This was a cross-sectional study undertaken at Paropakar Maternity and Women's Hospital from April 1, 2012 to March 31, 2013. Patient characteristics, gestational age, booking status, indication for intensive care unit admission, intervention, length of stay and outcome were analyzed.

Results: During the study period, 19,247 deliveries occurred and 247 women were admitted to maternal intensive care unit. This accounts for 1.28% of all deliveries. The most common indication of admission to intensive care unit was hypertensive disorders in pregnancy (45.3%) followed by obstetric hemorrhage (39.27%). Sepsis was the cause in ten (4.04%) cases. Ten cases (4.04%) of postpartum hemorrhage were managed by balloon tamponade, seven (2.83%) by B-Lynch compression sutures and three (1.21%) necessitated cesarean hysterectomy. Among 18 cases of ruptured uterus, 13 (5.26%) were repaired while five (2.02%) required hysterectomy. Maternal mortality occurred in four (1.61%) of the cases. One was a case of severe preeclampsia who died on 4th post-operative day due to pulmonary embolism, another due to anesthetic complication and the other two died of septic shock and multiorgan failure.

Conclusions: Hypertensive disorders of pregnancy and obstetric hemorrhage appeared as the major risk factors influencing maternal outcomes in obstetric patients.

Keywords: intensive care unit; maternal morbidity; maternal mortality.

INTRODUCTION

Although pregnancy and delivery are physiological processes, any sort of morbidity that might be encountered during these time courses might lead to fatal consequences regarding not only the fetus but the mother as well. Each year nearly 529,000 women die globally due to pregnancy related causes.¹ Maternal death is a tragic event, as pregnant women are generally young and healthy patients.² Despite developments in diagnosis and treatment, maternal death is still a serious public health problem.^{3,4} The transfer of an obstetrical patient to the intensive care unit (ICU) is considered to be an indicator of maternal morbidity.⁵ The complications that develop during pregnancy or in the postpartum period may be life-threatening and may require ICU transfer.⁴ It is now believed that between 0.1 to 0.9% of pregnant women

have complications requiring ICU admission.⁶ Early admission and appropriate management of critical obstetrical patients to the ICU decreases maternal morbidity and mortality. There is growing evidence that admission of high risk obstetric patients to the ICU is associated with a fall in maternal mortality.⁷ The objective of the present study was to determine the outcome of the obstetric admissions to Maternal Intensive Care Unit (MICU) in the setting of a tertiary care hospital.

METHODS

This was a cross-sectional study undertaken at Paropakar Maternity and Women's Hospital (PMWH) from April 1, 2012 to March 31, 2013. Ethical approval was obtained from the hospital and informed consent was obtained from the patients. Patient characteristics, gestational age, booking status, indication for ICU admission, intervention in ICU, length of ICU stay and outcomes were analyzed.

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RESULTS

During the study period, a total of 19,247 deliveries occurred and 247 women were admitted to MICU. This accounts for 1.28% of all deliveries. Majority of the ICU admissions occurred in 20-34 years of age (79.7%), 19 (7.69%) in 35-39 years and eight (3.23%) occurred 40-49 years age group. Most of them were nullipara 117 (47.3%), multipara 124 (50.2%) and grandmultipara 6 (2.42%). Postpartum cases were more (52.3%) than antepartum cases (47.3%) and unbooked cases were (70.8%) (Table 1).

Table 1. Obstetric characteristics of the patients (n=247).

Age	Number (%)
15-19	23 (9.31)
20-34	197 (79.75)
35-39	19 (7.69)
40-49	8 (3.23)
Parity	
0	117 (47.36)
1-2	102 (41.29)
3-4	22 (8.90)
≥5	6 (2.42)
Gestational age (weeks)	
<13	15 (6.07)
13-27	7 (2.83)
≥ 28	95 (38.46)
28-32	18 (7.28)
33-36	33 (13.36)
37-40	35 (14.17)
41-43	9 (3.64)
Postpartum	130 (52.63)
Booked	72 (29.14)
Unbooked	175 (70.85)

The most common indication of admission to ICU was hypertensive disorders in pregnancy (45.3%) followed by obstetric hemorrhage (39.27%). Sepsis was the cause in ten (4.04%) cases.

Table 2. Diseases responsible for illness (n=247).

Diseases	Number (%)
Hypertensive disorders in pregnancy	112 (45.34)
Severe preeclampsia	84 (34)
Chronic hypertension with superimposed preeclampsia	3 (1.21)
Eclampsia	22 (8.90)
HELLP syndrome	3 (1.21)
Obstetric hemorrhage	97 (39.27)
Ruptured ectopic pregnancy	8 (3.23)
Incomplete abortion with severe anemia	7 (2.83)
Molar pregnancy with complications	9 (3.64)
Placenta previa	12 (4.85)
Abruptio placenta	6 (2.42)
Ruptured uterus	18 (7.28)
Retained placenta	7 (2.83)
Uterine inversion	1 (0.40)
Placenta increta	1 (0.40)
Primary PPH	24 (9.71)
Secondary PPH	4 (1.61)
Sepsis related	10 (4.04)
Puerperal sepsis	2 (0.80)
Septic abortion	2 (0.80)
Chorioamnionitis	5 (2.02)
Obstructed labour	1 (0.40)
Others	28 (11.33)
Severe anemia	3 (1.21)
Neurological disorder	6 (2.42)
Cardiopulmonary arrest	1 (0.40)
Pulmonary embolism	1 (0.40)
Lower respiratory tract infection	2 (0.80)
Pleural effusion	2 (0.80)
Gestational Diabetes Mellitus (GDM)	2 (0.80)
Heart disease	4 (1.61)
Cardiomyopathy	2 (0.80)
Epilepsy	2 (0.80)
Post partum psychosis	3 (1.21)

Table 3. Interventions required in MICU (n=247).

Interventions required	Number (%)
Mechanical ventilation	6 (2.42)
DC shock	3 (1.21)
Vasoactive infusion	29 (11.74)
Intensive monitoring	104 (42.10)
MgSO ₄ therapy	53 (21.45)
Antihypertensive therapy	96 (38.86)
Blood transfusion	97 (39.27)
FFP transfusion	29 (11.74)
PRP transfusion	5 (2.02)

Ten cases (4.04%) of postpartum hemorrhage (PPH) were managed by balloon tamponade, seven (2.83%) by B-Lynch compression sutures and three (1.21%) necessitated cesarean hysterectomy due to intractable hemorrhage. These were due to placenta increta, twins with placenta previa type IIb and placenta previa type IIa.

Among 18 cases of ruptured uterus, 13 (5.26%) were repaired while five (2.02%) required hysterectomy, among which four cases were grand multipara, unbooked and was brought to ER in second stage of labour with hemorrhagic shock, two of them had intrauterine fetal death. Another was a case of misoprostol induction in which the uterus ruptured at 3 cm dilatation.

The mean stay at MICU was 2.8 days (range: 1-14 days).

Table 4. Stay in ICU (n=247).

Day(s)	Number (%)
1	59 (23.88)
2	74 (29.95)
3	50 (20.24)
4-10	60 (24.29)
11-14	4 (1.61)

Twenty-six (10.52%) were referred from various hospitals mostly from periphery. However, 113 (45.74%) had landed in emergency room (ER) for the first time with severe complications. Ten (4.04%) were referred to multidisciplinary centers.

During the study period, maternal mortality occurred in four (1.61%) of the cases. One was a case of severe preeclampsia who died on 4th post-operative

day (POD) due to pulmonary embolism. The other case was 40 years grandmultipara, a referred case of molar pregnancy who was brought to ER in moribund condition associated with disseminated intravascular coagulation (DIC) and multiorgan failure and died after 2 hours. Another case, on her 2nd postpartum day (PPD) following home delivery was presented to ER with septic shock and multiorgan failure and died the next day. The fourth case was anesthetic complication. When general anesthesia (GA) was given after subarachnoid block (SAB) failure, patient had bronchospasm and died of cardiopulmonary arrest due to suspected hypersensitivity reaction leading to pulmonary edema.

DISCUSSION

A total of 247 obstetric cases were admitted to MICU during the study period accounting for 1.28% of all deliveries. This is similar to the study conducted by Togonal et al.⁸ In several other studies, the incidence varied from 0.1-0.9%.⁹⁻¹¹ In the present study, majority of the patients were young between 20-34 years of age (79.7%), while 27 (10.9%) were \geq 35 years of age. Most were multipara (50.2%) and primipara (47.3%) but grandmultis accounted for 2.42% of cases. This is similar to studies conducted in Hyderabad and Pakistan.^{12,13} A study conducted in Hyderabad showed majority of patients 63 (76%) were young between 21-30 years of age and mostly 41 (49.4%) women were multipara, 26 (31.3%) were primipara while 16 (19.3%) women were grandmultipara.¹²

Postpartum cases (52.6%) were more than the antepartum cases in our study (47.36%) which is similar to other studies.^{7,9,14} However, this is in contrast with the previous study conducted in Hyderabad, where antepartum cases were 78% and postpartum 22%.¹² In the present study, most of the patients were 37-40 weeks of gestation which is similar to other studies.^{12,15} Lack of antenatal care was associated with risk factor for ICU admission as majority 70.8% of our patients were unbooked, as observed in other studies being 77% and 84.2%.^{12,16} In the present study, the most common indication of ICU admission was hypertensive disorder of pregnancy (45.34%) followed by obstetric hemorrhage (39.27%). This is similar to several other studies which showed that preeclampsia/eclampsia was the predominant indication for admission to their ICUs.¹⁷⁻¹⁹ Some other

studies have shown that obstetric hemorrhage was the predominant diagnosis for admission.²⁰⁻²⁴ Most studies were in agreement that preeclampsia/ eclampsia and obstetric hemorrhage were the commonest diagnoses for admission to the ICUs.^{6,7,19,20,22,25-27} In our study, though sepsis was less common (4.04%), it accounted for 10% of ICU admission in some studies^{10,12} while 17% and 26.7 % in others.^{9,13}

In the present study, seven cases (2.8%) of PPH was managed with B-Lynch compression sutures while eight cases required hysterectomy, five for ruptured uterus and three for intractable PPH. In other studies, two patients were managed with modified B-Lynch compression sutures¹² and hysterectomy due to haemorrhage was carried out in seven, two and ten patients.^{8,12,16} The interventions required are depicted in Table 3. This is in accordance with the study by Anwari et al²⁰ where ionotropic support (9%), MgSO₄ therapy (25%) were needed and almost one third of patients received antihypertensive therapy, blood and blood products (46%). In another study, 66% of the patients required packed erythrocyte transfusions and 33% of the patients required platelet transfusions, whereas 66% of the patients required fresh frozen plasma transfusions.⁸ The timely and appropriate management with these therapies would definitely save a mother's life. The mean stay at MICU was 2.8 days (range: 1-14 days) which is comparable with the previous study in which the period of stay in ICU varied from 1-20 days¹² and 1-15 days.²⁸ Prolonged ICU stay reflects the severity of the complication. The percentage of the obstetric patients requiring mechanical ventilation in the ICU has been reported as 19% by Selo-Ojeme et al,²⁹ 36% by Anwari et al,²⁰ 41% by Cohen et al,³⁰ and 64% by Tripathi et al,³¹ are all much higher than the present study rates of (2.42%). This could be due to early and elective admission to ICU in high-risk patients in our study.

In the present study, though twenty-six (10.52%) were referred from periphery hospitals, others have landed to ER for the first time with severe

complications (45.74%). Ten (4.04%) were referred to multidisciplinary centers. Therefore early recognition of complications and early referral would help in reducing admissions to ICU setup and thereby the morbidity associated with it. The maternal mortality rate from different parts of India, revealed maternal mortality of 41.67% (Rajasthan)¹⁵ and 43.63% (Ludhiana, Punjab)²⁸ and was quite high 68.4% in the study conducted in Karachi¹⁶ while the rate varied between 1.3- 41.2% in different studies.^{6,7,9,13,17,31,32} In the present study, maternal mortality occurred in four (1.61%) of the cases. One was a case of severe preeclampsia who died on 4th POD due to pulmonary embolism, another due to anesthetic complication and the other two died of septic shock and multiorgan failure. Similarly, in one study, multiorgan failure has been reported to be the most common cause of maternal death in the obstetric patients.³³ However, the low maternal mortality in our study is encouraging. Early admission and appropriate management of critical obstetric patients to the ICU may decrease maternal morbidity and mortality. The need for maternal intensive care should be one of the most important measures to be considered in the quality of maternal care.

CONCLUSIONS

Hypertensive disorders of pregnancy and obstetric hemorrhage appeared as the major risk factors for admission to an intensive care unit thereby influencing maternal outcome in obstetric patients.

DISCLOSURE

The authors report no conflicts of interest in this work.

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