

DOI: <http://dx.doi.org/10.18203/2320-1770.ijrcog20181463>

Original Research Article

Pattern of admissions, clinical course and short term outcome of patients admitted to an obstetric ICU of a tertiary care hospital of north India: a retrospective study

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Received: 24 March 2018

Accepted: 31 March 2018

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ABSTRACT

Background: Obstetric ICUs have become an important part of any tertiary care obstetric hospital. There have been studies in different parts of the world including India to determine the clinical spectrum, management and outcome of the patients admitted to these units. There have been a few studies on the subject from our part of the country, so we tried to carry out the said study. Our objective was to study indications of admissions, the pattern of complications, interventions required, and the maternal and fetal /neonatal outcome of the patients admitted in an obstetric ICU of our hospital.

Methods: A retrospective descriptive study carried out at Lalla Ded hospital Srinagar, a tertiary care hospital of north India, between January 2017 and June 2017.

Results: Fifty patients among 4890 obstetric admissions required ICU care giving an admission rate of 1.02%. Most of the patients fell in the age group of 26-30years (52%) followed by 31-35 years (24%). The most frequent indication for admission to ICU was pregnancy induced hypertension related eclampsia and preeclampsia which constituted about 44% (n=22) of the admissions. Obstetric haemorrhage was a close second and accounted for 34% (n=17) of the admissions. Mean ICU stay was 2.5±1 days. Four patients died giving a maternal mortality rate of 8% in this ICU. There were eleven fetal and neonatal deaths excluding ectopic pregnancy giving a fetal /neonatal mortality rate of 22%.

Conclusions: Obstetric ICUs have become an important part of any tertiary care obstetric hospital. Significant number of patients get admitted and treated in these ICUs. In our part of the world majority of ICU admissions are because of eclampsia/preeclampsia and obstetric haemorrhage. Although a large number of mothers and their neonates get benefitted by way of admission to ICUs, a significant proportion of these mothers and their neonates die. There is a lot of scope of improvement in maternal and perinatal mortality. In addition to the importance of setting up of state of the art obstetric ICUs, the need for supervision of pregnancies, institutional deliveries, early detection of complications and early referral cannot be overemphasized.

Keywords: Clinical course, Outcome, Obstetric ICU

INTRODUCTION

Although pregnancy is a physiological process, but certain proportion of pregnant women develop complications. Most of these complications are managed outside ICU, however a certain proportion of these women require treatment in an intensive care setup. Obstetric critical care has developed very much in past few decades and obstetric ICU forms an important part of any tertiary care obstetric hospital these days. Earlier these patients were managed in surgical or medical ICUs but now obstetric ICUs have taken over. This is true even in developing countries where these ICUs have come up almost everywhere. These ICUs are widely believed to have made a significant dent in tertiary care maternal mortality and helped in improving pregnancy outcomes.

The most common indications for admissions to these ICUs varies between regions. In some reports from developed countries the common causes of admission include pregnancy related hypertensive disorders, obstetric haemorrhages.¹⁻⁷ In India studies have shown pregnancy related hypertensive disorders, obstetric haemorrhages and sepsis to be common indications for ICU admission.⁸⁻¹³ The fetal and maternal outcome in the ICUs also varies between regions. In India the maternal mortality has been reported between 12-33%, while perinatal mortality has been reported as 12-47%.^{2,6-13}

Since we did not have many studies regarding the pattern of ICU admissions from our part of the country, we looked into the indications of admissions, the pattern of complications, interventions required and the maternal and fetal /neonatal outcome of the patients admitted in an obstetric ICU of our hospital and tried to compare the data with that of other studies from India and from outside India

METHODS

This was a retrospective study done over a period of six months between January 2017 to June 2017. This study was done at Government Lalla Ded Hospital Government Medical College Srinagar Jand K India which is a lone tertiary care gynae and obstetric hospital of Kashmir valley catering to whole of its population and some parts of Jammu and Ladakh divisions. It has a dedicated ICU which has a bed strength of 15 and is equipped with 4 ventilators. It is jointly supervised by obstetricians and critical care anesthetists.

Authors collected data pertaining to all the ICU admissions during the specified period from the hospital records and entered the relevant data and information into the predesigned proforma. Data was collected regarding age, residence, parity, booking status, admission diagnosis, complications, investigations during ICU stay, interventions required, fetal, neonatal and maternal outcome.

The data was entered into Microsoft excel sheet and analysed with SPSS 16 software. The results were expressed as percentages and proportions, Outcome was described as death/discharge in mothers and death survival in case of fetus/neonates.

RESULTS

There was a total of 4890 obstetric admissions over a period of six months in the hospital. The number of admissions in ICU was 50, giving an ICU admission rate of 1.02%. Most of the patients fell in the age group of 26-30 years (52%) followed by 31-35 years (24%). Sixty eight percent women were multigravida while 36% were primigravida. Maximum patients 40 (80%) were from rural background. More patients were unbooked 30 (60%). Sixty five percent patients delivered by caesarian section while 35% delivered by normal vaginal delivery. Baseline characteristics are given in Table 1.

Table 1: Baseline characteristics.

Baseline characteristics	n (%)
Age	
<20	0 (0%)
20-25	7 (14%)
26-30	26 (52%)
31-35	12 (24%)
>35	5 (10%)
Parity	
Primi	16 (32%)
Multi	34 (68%)
Location	
Urban	10 (20%)
Rural	40 (80%)
Booking status	
Booked	20 (40%)
Unbooked	30 (60%)
Mode of delivery n=49	
Caesarian	32 (65%)
vaginal	17 (35%)

The most frequent indication for admission to ICU was pregnancy induced hypertension related eclampsia and preeclampsia which constituted about 44% (n=22) of the admissions. Obstetric haemorrhage was a close second and accounted for 34% (n=17) of the admissions. Out of the 17 with obstetric haemorrhage nine had antepartum haemorrhage and eight had postpartum haemorrhage giving an equal frequency of admission to ICU among these.

Two (4%) patients had septicemia. There were 2 patients each of ruptured uterus and post delivery sudden collapse possibly arrhythmias and one each of achondroplasia, ischemic heart disease, mitral stenosis, myaesthesia gravis, post LSCS hematoma and anaphylaxis. The admission indications are further summarized in Table 2.

Table 2: Indication for admission.

Indication	n (%)
Eclampsia/preclampsia	22 (44%)
Obstetric haemorrhage	17 (34%)
APH	8 (16%)
Placenta previa only	3
Placenta accrete/percreta	2
Placental abruption	3
PPH	7 (16%)
Septicemia	2 (4%)
Uterine rupture/tear	2 (4%)
Ruptured ectopic	1 (2%)
Miscellaneous	8 (16%)
Achondroplasia	1
Ischemic heart disease	1
Mitral stenosis	1
Myaethenia gravis	1
Post LSCS hematoma	1
Anaphylaxis	1
Post delivery sudden collapse? arrhythmia	2

*Ruptured ectopic not included.

As far as complications are concerned 22 (44%) had hypertension while 13 (26%) presented as shock mostly haemorrhagic shock in 10. Four (8%) patients developed disseminated intravascular coagulation. Seizures occurred in 11 patients (22%) out of which nine had eclamptic seizures and 2 had non eclamptic seizures.

Table 3: Complications.

Complications	n (%)
Hypertension	22 (44%)
shock	13 (26%)
Disseminated intravascular coagulation (DIC)	4 (8%)
Acute kidney injury	6 (12%)
Acute liver failure	0
Pulmonary involvement	6 (12%)
Pulmonary edema	4
ARDS	1
Pneumonia	1
Cardiac involvement	9 (18%)
Congestive heart failure	7
Left ventricular failure	1
Decreased Ejection fraction	1
seizures	11 (22%)
Eclamptic seizures	9
Non eclamptic seizures	2
Hemoglobin g%	
>10	10
7-10	22
<7	18
Thrombocytopenia (Platelets <1 lakh/mm ³)	8 (16%)
Deranged Coagulogram	4 (8%)

Acute Kidney injury (AKI) was found in 6(12%) of patients. Cardiac and pulmonary involvement was found in 18 and 12 % patients respectively. Moderate to severe anemia was found in almost 60% of the patients, Thrombocytopenia (platelet count <1 lac /mm³) was found in 8(16%) of the cases. Coagulogram was deranged in 4(8%) of the patients. The complications are further summarized in Table 3.

Thirty patients (60%) required mechanical ventilation. Mean duration of mechanical ventilation was 1.5±0.6 days with a range of 4 hours to 15 days. Ten (20%) required inotropic support. Mean duration of inotropic support was 2.3±1 days. Twenty two (44%) patients required magnesium sulphate. One patient required dialysis. Antibiotics were given in 35 (70%) of patients. Blood and component transfusion were given in 22 (44%) of patients. The medical interventions are summarized in Table 4.

Regarding surgical interventions, caesarean section was done in 20 patients (40%). These include women with post caesarean complications. Caesarean hysterectomy was done in 8 (16%) of the patients. Uterine artery ligation, laparotomy for ruptured ectopic, vaginal tear repair and exploratory laparotomy for post caesarean hematoma was done in one patient each. Surgical interventions are summarised in Table 4.

Table 4: Interventions carried out.

Interventions	n (%)
Medical	
Ventilation	30 (60%)
Inotropic support	10 (20%)
Magnesium sulphate	22 (44%)
Dialysis	1 (2%)
Antibiotics	35 (70%)
Blood and component transfusion	22 (44%)
Surgical	
Caesarean section only	20 (40%)
Hysterectomy	9 (18%)
Uterine artery ligation	1 (2%)
Laparotomy (Ruptured ectopic)	1 (2%)
Vaginal tear repair	1 (2%)
Exploratory laparotomy and hematoma drainage	1 (2%)

Table 5: Outcome.

	Died	Survived	Mortality
Maternal	4	46	8%
Fetal/neonatal (fetal loss, IUD, still birth)	11	38*	22.4%

Mean ICU stay was 2.5±1 days. Four patients died out of 50 admitted in ICU giving a maternal mortality rate of 8% in this ICU. There were eleven fetal and neonatal

deaths excluding ectopic pregnancy giving a mortality rate of 22% (Table 5).

DISCUSSION

This study is only one among the few studies that have been done in the developing world on this subject. We found that the ICU admission rate was 1.02% which is very high. The ICU admission rate was found to be 0.4 to 1.2% in other Indian studies.⁸⁻¹³ In developed world the ICU admission rate has been reported to be between 0.7-13.5%.⁴ The reason for high ICU admission rate is simply because of poor antenatal supervision, non institutional deliveries, late recognition of complications and delayed referral.

The most common indication for ICU admission was PIH related disorders including eclampsia and preeclampsia in 44% of the cases, closely followed by obstetric haemorrhage in another 24 % of the cases. We had sepsis in two patients only (4%). Pregnancy related hypertensive disorders have been reported as a leading cause of ICU admission in a number of Indian studies.^{8,9} However in some studies obstetric haemorrhage has been reported as the commonest cause of ICU admission.^{10,12,13} In one of the studies septicemia has been found to be the commonest indication for ICU admission.¹¹ In developed countries the indications for admissions have varied between centres primarily because of the different referral nature of these hospitals which might be the reason for the observed heterogeneity. The most common indication for ICU admission has been either eclampsia/preeclampsia or obstetric haemorrhage.¹⁻⁷ In brief pregnancy related hypertensive disorders and Obstetric haemorrhage together account for majority of the patients admitted to ICU. In addition to direct obstetric causes we had around eight patients who were admitted because of indirect obstetric causes.

A significant proportion of patients presented with hypertension as expected (44%) because the leading cause of ICU admission was PIH, next in frequency was shock which was present in 26% of patients and most of which was haemorrhagic because of either APH or PPH. Out of 15 obstetric haemorrhage patients 10 had shock. Two had septic shock and one had shock due to cardiac ailment. Pulmonary, cardiac and renal involvement was found in 12 %,12% and 18% of the patients respectively. In one of the studies done in India this proportion was found to be 22,25 and 4 % respectively.⁸ The high incidence of renal involvement in present study might partly be due to inclusion of all patients with decreased urine output or oliguria into this group.

Mechanical ventilation was carried out in 60% of the cases (n=30) while inotropic support was needed in 40% of the cases (n=20). Dialysis was done in one patient. Mechanical ventilation rates have been higher in other Indian studies to the tune of 87-94%.^{8,9} In one of the studies the inotrope use has been very high in almost 85%

of the cases however another study put it at 40%.⁹ In studies outside India the mechanical ventilation rate has been reported as 36 and 58% in two of the studies.^{3,6} The less proportion of patients needing mechanical ventilation and inotropic use in present study might be because of a slightly liberal policy for ICU admission in our hospital. Antibiotics and magnesium sulphate were also used in 70% and 44% respectively. The percentage use of antibiotics and magnesium sulphate has varied among studies depending upon the number of PIH and sepsis patients admitted to the ICU.^{8,9}

As far as surgical intervention is concerned, only caesarean section was done in 20 patients (40%) of the patients, Hysterectomy was done in 9 patients (18%). Other procedures required rarely were uterine artery ligation, laparotomy for post caesarean hematoma, laparotomy for ectopic pregnancy and vaginal tear repair in one of the patients of PPH.

Maternal mortality in our ICU was 8% while fetal/neonatal mortality was 22%. In India the maternal mortality has been reported between 12-33%, while perinatal mortality has been reported as 12-47%.^{2,6-13} Four mothers died, 2 because of PPH, 1 of abruptio placentae and 1 of Uterine rupture. Most of maternal deaths that have occurred in other studies have been because of obstetric haemorrhage.^{4,8,9} The high fetal/neonatal mortality in our hospital may be accounted by late referral to our centre at which time fetal compromise has already occurred.

CONCLUSION

Obstetric ICUs have become an important part of any tertiary care obstetric hospital. Significant number of patients get admitted and treated in these ICUs. In our part of the world majority of ICU admissions are because of eclampsia/preeclampsia and obstetric haemorrhage. Although a large number of mothers and their neonates get benefitted by way of admission to ICUs, however a significant proportion of these mothers and their neonates die. There is a lot of scope of improvement in maternal and perinatal mortality. In addition to the importance of setting up of state of the art obstetric ICUs, the need for supervision of pregnancies, institutional deliveries, early detection of complications and early referral cannot be overemphasized.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

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Cite this article as: Nigeen W, Salam S, Ashraf S, Bhat AS. Pattern of admissions, clinical course and short term outcome of patients admitted to an obstetric ICU of a tertiary care hospital of north India: a retrospective study. *Int J Reprod Contracept Obstet Gynecol* 2018;7:1749-53.