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RESEARCH ARTICLE

EVALUATION OF OBSTETRIC ADMISSIONS TO INTENSIVE CARE UNIT OF A TERTIARY CARE CENTRE: A TWO YEAR STUDY

***Beenish Yousseff and Samiya Mufti**

Department of Obstetrics and Gynaecology, Lalla Ded Hospital, A Tertiary care and Teaching Institute, Government Medical College and associated Hospitals , Jammu And Kashmir India

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ABSTRACT

Care of the critically ill parturients is a unique challenge in obstetrics particularly because of its unpredictability. The major contribution to mortality and morbidity being obstetric haemorrhage, toxaemia of pregnancy, severe anemia and sepsis, especially in developing countries. **Method:** This study evaluated the obstetric admissions to ICU in our tertiary care 700 bedded centre over a 2 year period; 'A retrospective Observational Study', from Jan 2017 to Dec 2018.The information collected included patient characteristics, vital signs and GCS on ICU admission, and outcome of patients admitted. The data obtained were analysed using descriptive statistics. **Results:** On analysis 0.6% of the total obstetric patients admitted during the study period required ICU admission(390), which constitutes to 1.02% of the total no. of deliveries(38,251).Severe PET/Eclampsia, (44.86%) 175 patients, and obstetrical haemorrhage (37.94%),148 patients were the two most common indications for admission to ICU.156(40%) patients received mechanical ventilation. **Conclusion:** Obstetric ICU management is a team approach involving obstetricians, anaesthesiologists and other physician/surgeon specialists for the optimal care of these patients. Early referral to tertiary care centres can minimise mortality in critically ill patients.

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INTRODUCTION

Care of the critically ill parturients is a unique challenge in obstetrics particularly because of its unpredictability. Changes take place in the maternal physiology to fulfil the needs of her health, fetus and the newborn during the pregnancy and the puerperium. These changes present an exclusive challenge, to the obstetric team, when these patients develop complications and need intensive care (Tempe, 2007; Okafor, 2004). Admission of obstetric patients occur approximately at 0.1-0.9% of the deliveries. Overall maternal death rate varies from 3.4-21% (Kilpatrick, 1992; Mabie, 1990).When such complications arise in obstetric patients, early intervention and treatment on a multi disciplinary basis in the ICU can alleviate progression of organ dysfunction and improve prognosis (Zeeman, 2006).

MATERIAL AND METHODS

A retrospective study was carried out from Jan 2017 to Dec.2018 in our tertiary care hospital and teaching institute, Govt. Lalladed Hospital of the GMC and associated hospitals. It is a700 bedded maternity hospital with a 8 bedded surgical intensive care, manned by the post graduate department of anaesthesiology and critical care. The hospital is a referral centre for cases from various peripheral hospitals. It has an annual delivery rate of 24,000-26,000, with a large number of referrals from PHC,s CHC,s District hospitals and other hospitals and maternity homes. Apart from ICU, 1 HDU one blood bank and 2 emergency operation theatres provide round the clock emergency obstetric services and critical care to the patients. All critically ill obstetric patients who require hemodynamic monitoring and vasopressor support, invasive or non invasive ventilator care, and also patients with severe organ dysfunction are admitted to the ICU. Medical and surgical consults are taken as and when required. The relevant data was extracted from the admissions and discharges of the ICU and the case files of the individual patients. The information retrieved contained age, parity, obstetric status, co-morbidities, mode of delivery, vital signs and Glasgow coma scores (GCS) on admission in the ICU. For ICU intervention, the data collected were need for MV, oxygen therapy, blood products/transfusions, anti hypertensive treatment and inotropic support. The data obtained were analysed using descriptive statistics.

****Corresponding author:*** **Beenish Yousseff,**
Department of Obstetrics and Gynaecology, Lalla Ded Hospital, A Tertiary care and Teaching Institute, Government Medical College and associated Hospitals , Jammu And Kashmir India.

RESULTS

During the two year period, a total of 390 obstetric patients were admitted to the ICU from 01-01-2017 to 31-12-2018.On admission to the ICU, etiological factors leading to the need for critical care analysed. The collected data has been shown in the following tables. During the study period there were a total of 63,947 antenatal/obstetric admissions, and the hospital had a total of 38,251 deliveries. These admissions included patients who were admitted to the hospital for antenatal complications, deliveries, abortion and its complications, ectopic pregnancy, obstetric haemorrhage, complications of puerperium. The analysis shows 0.6% of the total obstetric patients admitted to the hospital required ICU admissions. When calculated for the number of deliveries, 1.02 required critical care. The age of the patients ranged from 23-44 years with the mean of 33.51 years. Approximately 2/3 of the patients admitted to the hospital were primigravida. The mean duration of stay was 3.3 ± 2.07 days. 312 patients (80%) of the patients were admitted in the postpartum period or postabortal period.

Table 1. Characteristics of Obstetric patients admitted

otal Number	390
Mean Duration of Admissions	3.30± 2.07 days
Age	23-44 years (average 33.51 years)
Parity	Primigravida-213 Multigravida-177
Ante Partum Admissions	78
Post-partum Admissions	312

Table 2. Frequency of obstetric ICU admissions

Year	Obstetric Deliveries	ICU Admissions	(%)
2017	20180	186	0.92%
2018	18071	204	1.12%

Severe Pre-eclampsia and its complications, and Eclampsia were the primary indications for admissions to ICU in 44.87% of patients. 87 patients (22.31%) presented with eclampsia and 88 patients (22.56%) with severe PET, with one patient of PET having HELLP-Syndrome (Hemolysis, Elevated liver enzymes, Low platelet count). Obstetrical haemorrhage (abruption, PPH, placenta previa, morbid adherent placenta, rupture uterus, ruptured ectopic pregnancy) was responsible for 37.94% of admissions to ICU. 40(10.26) patients had PPH, while 76 patients (19.5%) had antepartum haemorrhage (APH).Uterine rupture was the cause PPH in 12(3.07%) patients. Haemorrhage due to ruptured ectopic pregnancy was present in 20 patients (5.13%). Hysterectomy was performed in 70 patients (18%)as a life saving methods where bleeding could not be controlled by conservative methods. Pregnancy with underlying cardiac disease and peripartum cardiomyopathy/cardiac complications accounted for (6.7%) of ICU admissions in 26 patients. We had a (50%) mortality rate in these patients with 13 out of 26 patients ending in severe cardiac decompensation with death. These patients were mostly referred with poor antenatal care and underlying anemia and infections. One hundred and fifty six (156), 40%, patients were mechanically ventilated. Mean duration of mechanical ventilation was 3 days. Apart from MV, ICU interventions included blood and blood products, inotropes, antihypertensives, anticonvulsants. 82 patients (21.02%) of the total 390 admitted to ICU, died. This included 18 of the 40 patients (45%) with severe PPH, 21 patients of 175 with PET and Eclampsia (12%), and 9 patients (11.8%) with APH. Postpartum/postabortal sepsis led to the death of 15 patients out of 23 admitted (65.21%), as these had presented late (referral from rural areas) with multiorgan dysfunction due to disseminated sepsis. This shows that infaction still plays an important role in maternal mortality and morbidity, thereby showing the need for stricter implementation of the MTP act. Pregnancy with hepatitis led to 0.5% of the admissions. Out of the 2 patients admitted, one ended in fulminant hepatitis with liver failure and died. Similarly we had 2 patients of pregnancy with pancreatitis, where 1 also had underlying sepsis due to IUD and later, succumbed. 12 patients were admitted to the ICU for monitoring after Generalised tonic clonic convulsions (GTC) in recovery after caesarean section. They probably developed some drug reaction and/or electrolyte imbalance due to vomiting and had 100% survival. On patient was admitted for exacerbation of underlying asthma, and 1 patient had GBS in the 3rd trimester, and needed critical care.

DISCUSSION

A total of 390 patients were admitted in the ICU during the study period which represents 1.02% of the total 38,251 deliveries during that period. This gives an incidence of 10.2 obstetric ICU admissions per 1000 deliveries. The maternal ICU admission rate was 0.97% from a study at Abuja (Okafor and Effetie, 2008) and 1.4% from a study in Ibadan Nigeria (Osinaike *et al*., 2006). A study conducted by Ghike *et al*., 2012 found that the total obstetric patients who needed ICU admissions were 1.04% of all deliveries which is comparable to our study. In our study, an increase in the maternal ICU admission rate signifies a trend of increasing ICU utilisation by obstetric patients. In the present study (37.94%) of the parturients were admitted with obstetric haemorrhage resulting from APH,PPH rupture uterus and ruptured ectopic. In some previous studies, hypertensive disorders of pregnancy, eclampsia and Preeclamsia were the most frequent reasons for admission of obstetric patients in the ICU,(Okafor and Effetie,2008; Osinaike *et al*., 2006; Niyaz *et al*., 2014; Ghike *et al*., 2012 and Lataifeh *et al*., 2010.

In our study, severe Preeclamsia and Eclampsia also represent the major chunk of ICU admission, 175 patients of 390 (44.87%). A variation in the pattern of admissions may be due to regional variation in the prevalence of obstetric complications. Hypertensive disorders of pregnancy,50%, and sepsis 17% were the two main obstetrical conditions responsible for maternal illness in astudy by Bibi *et al* 2008 (Bibi, 2008). In our study 23 patients were admitted with infective causes, puerperal and post abortal sepsis (5.9%), and 15 patients succumbed to their illness(65.21%), indicating that infection is still a major factor in maternal morbidity in our country. This is comparable to the study by Chawla, *et al* 2013(Chawla *et al*., 2013) where mortality due to sepsis was as high as 75%. It has been observed that hemodynamic and respiratory complications needing inotropic support or ventilator support remain the most common reasons for ICU admission and the need for support may predict poor outcome. Our study shows 156 patients,(40%) needed mechanical ventilation for respiratory complications and hemodynamic instability. A study by Sriram 2008 (Sriram *et al*., 2008) found, mechanical ventilator support was required for 61% of the patients and Bibi in their study showed 40% of the patients required critical care for hemodynamic instability. Blood and blood product transfusion was one of hte major component of ICU care, about 128(33%) required multiple transfusions.

Table 3. Indications for admissions in the ICU

S.no	Diagnosis	Number admitted	Percentage (%)
1	Postpartum haemorrhage (PPH)	40	10.25
2	Severe PET/with complications	88	22.56
3	Eclampsia	87	22.31
4	Antepartum Haemorrhage (Abruption,Placenta-previa,Morbidly adherent placenta)	76	19.5
5	Ruptured ectopic	20	5.13
6	Rupture Uterus	12	3.07
7	Pregnancy with cardiac disease/ cardiac complications	26	6.7
8	Postpartum/post abortal sepsis	23	5.9
9	Post LSCS convulsions	12	3.07
10	Pregnancy with hepatitis E Encephalopathy	2	0.5
11	Pregnancy with pancreatitis	2	0.5
12	Pregnancy with asthma	1	0.25
13	Pregnancy with Gullian Bari Syndrome(GBS)	1	0.25
Total		390	100

Table 4. Outcome of Admissions of the Obstetric patients

S.no	Diagnosis	Number admitted	Number Survived	Number Died	Percentage (%)
1	Postpartum haemorrhage (PPH)	40	22	18	45
2	Severe PET/with complications	88	77	11	12.5
3	Eclampsia	87	77	10	11.49
4	Antepartum Haemorrhage (Abruption,Placenta-previa,Morbidly adherent placenta)	76	67	9	11.8
5	Ruptured ectopic	20	19	1	5
6	Rupture Uterus	12	9	3	25
7	Pregnancy with cardiac disease/ cardiac complications	26	13	13	50
8	Postpartum/post abortal sepsis	23	8	15	65.21
9	Post LSCS convulsions (Drug reaction/electrolyte imbalance)	12	12	-	0
10	Pregnancy with hepatitis E Encephalopathy	2	1	1	50
11	Pregnancy with pancreatitis	2	1	1	50
12	Pregnancy with asthma	1	1	-	0
13	Pregnancy with Gullian Bari Syndrome(GBS)	1	1	-	0
Total		390			100

Table 5. ICU Interventions

S.no	Interventions	Frequency	Percentage
1	Mechanical Ventilation	156	40%
2	Blood and blood products	128	33%
3	Inotropes /vasopressors	30	7.69%
4	Antihypertensives	175	44.87%
5	Anticonvulsants	12	3.07%
6	Obstetric hysterectomy	70	17.94%
7	Dilation and curettage	8	2.05%
8	Laparotomy	75	19.23%

There were 82 maternal deaths, 21.02% during the study period, which is comparable to the study by Chawla *et al*., 2013 with 28.5% mortality, Bibi *et al*. (2008), also reported a similar mortality rate.Suleiman *et al*. 2006, had a mortality of 10%.In our study,31 patients died of hypovolumic shock and/or end organ failure and complications, (severe PPH 18, 9 APH,3 rupture uterus,1 ruptured ectopic) with a mortality of 20.94% for haemorrhage related deaths.15 patients out of 23 admitted for sepsis died. The same has been seen in studies by Osinaike 2006 and Bibi 2008 (Bibi, 2008). In a study by Chawla eta al. (2013), 3 out of 4 patients admitted for sepsis succumbed, indicating the major role of infection related mortality in our country. In our study, 13 patients died due to severe cardiac decompensation (50%MR) due to underlying heart disease and/or peripartum cardiomyopathy, with majority of these having poor antenatal care, and underlying anemia and infections. In a study by Ebrium and Ojum 2012 where only 34% of patients admitted in ICU had antenatal care, 25% died of postpartum anemic cardiac failure and 50% died after post cardiopulmonary resuscitation.2 cases were admitted with pregnancy with hepatitis E with one ending in fulminant hepatitis and died. Liver failure was found in 3.5% admissions in a study by Chawla *et al*., 2013 with all 3 patients ending in death due to liver failure. In our review, 12 patients who developed convulsions after caesarean section (drug reaction/electrolyte imbalance) were admitted for monitoring with 0% mortality.

Conclusion

The incidence of obstetric ICU admission from this study was 10.2 per 1000 deliveries. Severe PET/Eclampsia (44.87), and obstetric haemorrh age (APH, PPH, Rupture uterus, Rupture ectopic), 37.94% were the most frequent reason for admissions to the ICU. The maternal mortality rate in this review was 21.02%.Low socio-economic status, lack of education and poor antenatal care have been found to have a considerable effect on obstetric complications and outcome. It is found that 72% of maternal deaths can be prevented through effective ANC.

Good antenatal care and early detection of high risk pregnancies, and prompt referral to tertiary care centres, where care of circulation, blood pressure and ventilation; can minimise multi organ failure and mortality in critically ill patients. Obstetric ICU management is ateam approach involving obstetricians and anaesthesiologists and other physicians/surgeon specialists. All residents of OBGYN should have short mandatory training phase in critical care.

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