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Original Research Article

A Study of Obstetric Outcome of ICU Admitted Patients: A 2 years Retrospective Observational Study

Dr Rajeshwari Laxman Khyade[1], Dr Kamlesh Chaudhari[2], Dr Neville Colaco[3]
[1]Assistant Professor, [2]HOD and Unit Head, [3]Intern, Department of OBGY, KJ Somiaya Medical College and Hospital, Mumbai

***Corresponding author**
Dr Rajeshwari Laxman Khyade
Email: krajeshwari2@yahoo.co.in

Abstract: Pregnant women are at risk of developing complications either due to aggravation of pre-existing disease or due to illness caused by pregnancy. These patients will require ICU admission and critical care management. Despite progress in medical field and improvement in the health facilities maternal morbidity and mortality is still very high in most of the developing nations. The aim is to study and evaluate the occurrence, indications, course, interventions and outcome of obstetric patients admitted to the intensive care unit. It is a retrospective study. The data collected was age, parity, obstetric status, primary diagnosis, interventions and outcomes of obstetric patients admitted to the ICU of a medical college hospital from Jan 2015- Dec 2016. Total deliveries were 2868 in two years. Obstetric admission to ICU were (n=32) which constitutes 1.1% of deliveries. Majority of the admissions were in postpartum period (n=28, 87.5%). The two common indications for admissions were obstetric hemorrhage (n=14, 43.7%) and pregnancy induced hypertension with its complications (n=11, 34.3%). Maternal mortality was (n=3, 9.3%). Critically -ill obstetric patients requirement for ICU is on increase and they require a team effort of the obstetrician, anesthesiologist and intensive care specialist for optimal care. Studying the near miss cases may help to enhance the hospital process for timely and better obstetric and medical interventions.

Keywords: Critical care in Obstetrics, Hypertension, Intensive care unit, Maternal mortality, Obstetrics hemorrhage.

INTRODUCTION

Obstetric patients are young, healthy and fit, *in spite* of good antenatal care due to maternal physiological changes taking place during pregnancy or due to preexisting medical conditions, the potential for catastrophic complications cannot be avoided. These changes present an exclusive challenge to the obstetrician team when patient develops complications and needs intensive care [1-3]. Hemorrhage, toxemia, anemia, and septicemia are common causes of mortality and morbidity in these patients [3]. Because of limitations of volume as well as expertise, a women who requires ventilator support, invasive monitoring or pharmacological support of circulation maybe better served by transfer to medical ICU. Critical care units provide the expert medical, nursing facilities and equipment's for 24x7 dedicated care of critically ill injured patient with the substantial use of high technology. The present data was obtained to understand the factors influencing the maternal outcome and recognize preventable factors that are responsible for untoward maternal outcome. The aim of our study was to review the indication for admission, demographics, clinical characteristics and obstetric outcome and to identify conditions associated with maternal morbidity and mortality admitted in the ICU in the last 2 years.

MATERIALS AND METHODS

A retrospective study of 2 years was conducted from January 2015 to December 2016 in a 500-bedded medical college and hospital with 10 ICU beds with no separate obstetric ICU. It is a tertiary center situated in the city with 1500 deliveries conducted every year. After ethical committee approval, the medical records of all patients admitted to the ICU during pregnancy or within 42 days of delivery were studied. The study included 32 obstetrics patients. A data collected was patients including their age, parity, obstetric status, primary diagnosis, and mode of delivery, complications, interventions, maternal outcome and duration of ICU stay.

RESULTS

All Obstetric patients admitted to the ICU from 1st Jan 2015 to 31st Dec 2016 were studied retrospectively. A total of 32 obstetric patients were admitted to the ICU during this period. A detailed study was made regarding the etiological factors leading to the ICU admission their management and outcome were analyzed.

During the study period, there were a total of

32 admissions for the obstetric reason in ICU and the hospital had a total of 2868 deliveries. These admissions included patients who were admitted to the hospital for antenatal complications, abortions, deliveries, ectopic pregnancy, obstetric hemorrhage and complications of puerperium. The analysis shows that 1.1 % of the total obstetric delivery were admitted to the hospital ICU.

Table 1: - Percentage of patients admitted to ICU

Year	No. of ICU patients	No. of obst ICU patient	Percentage
2015	83	18	21.6%
2016	238	14	5.8%
Total	321	32	9.9%

There were a total of 321 admissions in the ICU over 2 years, thus indicating that obstetric patients accounted for 9.9% of all the patients admitted to the ICU. The high rate of admission in our study might be high due to the lack of High Dependency Unit (HDU) where patients not suitable for ward observation were transferred to the ICU.

Table 2- Patients characteristics according to Age wise distribution

Age in years	Number of patients	Percentage
20-24	12	33.3%
25-29	14	46.6%
30-34	2	6.6%
>35	4	13.3%
Total	32	100%

Table shows the age of the patients ranged from 20-38 years and majority of the patients were between 20-30 years of age. (33.3% and 46.6%).

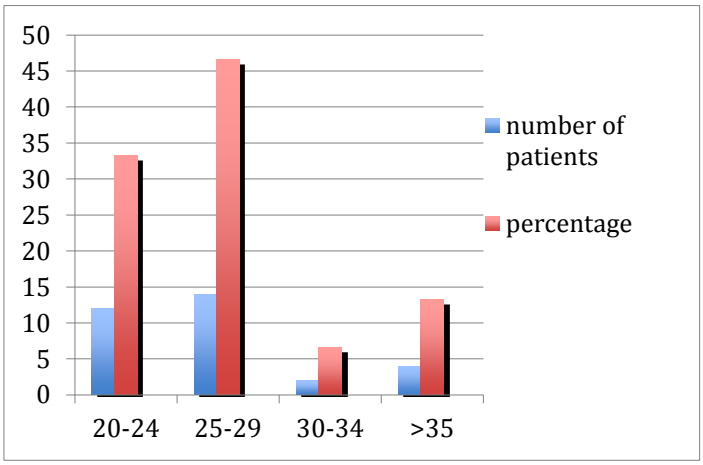

Table 3: - Patients characteristics according to Parity wise distribution

Parity	Number of cases	Percentage
Primigravida	14	43.7%
Multigravida	18	56.3%
Total	32	100

Approximately more than half patients were multigravida (n=18, 56.7 %) and primigravida were (n==14, 43.7%).

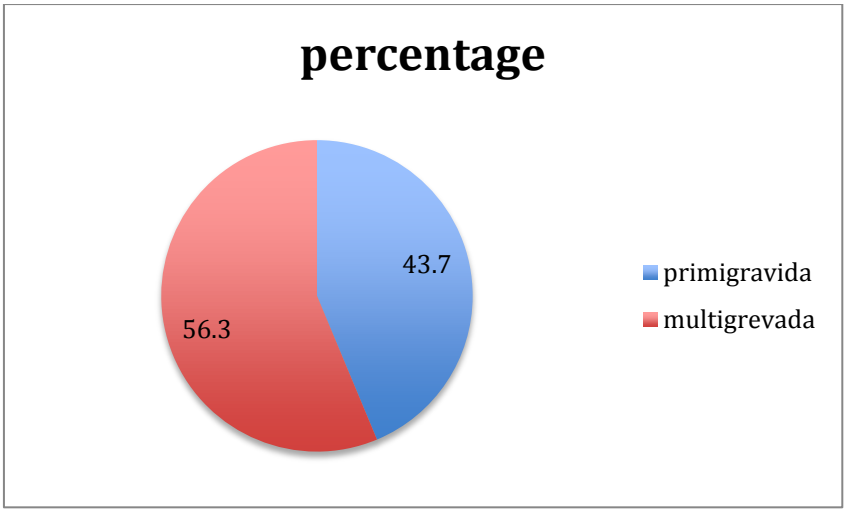

Table 4: - Patients characteristics according to the period of Gestation

Period of Gestation	Number of patients	Percentage
Antepartum	4	12.5%
Postpartum	28	87.5`%
Total	32	100

Most of the patients admitted to the ICU were in the 3rd trimester and during immediate postpartum or post abortal period (n=28, 87.5%).

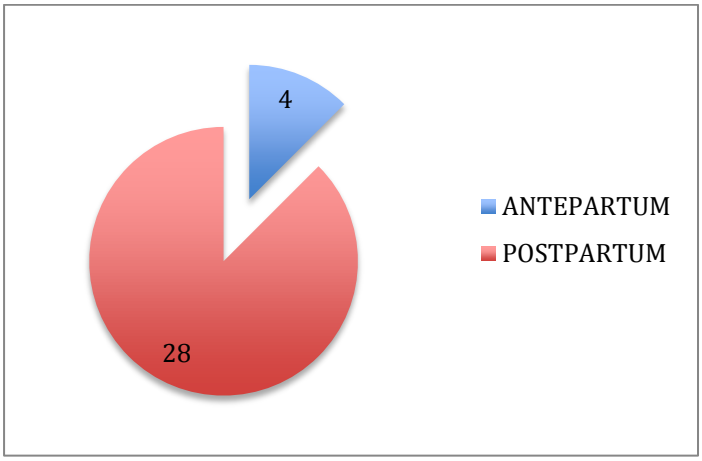

Table 5: - Primary diagnosis at the time of ICU admission

Obstetric Indication	Number of cases	Non-obstetric Indication	Number of cases
Hypertensive disease	2	Anemia	2
Preeclampsia	3	Dengue	1
Eclampsia	4	Cardiac causes	2
HELLP and DIC	2	Diabetics	1
Antepartum hemorrhage	3		
Postpartum hemorrhage	11		
Amniotic fluid embolism	1		
Total	26		6

Table 5 shows Obstetrical hemorrhage i.e. abruption, PPH, placenta previa, accreta and increta, rupture uterus and ruptured ectopic was responsible for (n=14, 43.7 %.) Preeclampsia and its complications were the primary diagnosis for the patient admitted to the ICU in (n=11, 34.3 %.). One patient was admitted to the ICU for amniotic fluid embolism while evacuating vesicular mole by suction evacuation. There was a sudden drop in saturation, patient had to be intubated and kept on the ventilator. Non-obstetric causes were

(n=6 18.75%), severe anemia with Hb less than 4 gms % (n=2, 6.2%). Cardiac causes (n=2, 6.2%) were with arteritis and another patient with ectopic beats was kept in the ICU for observation. One patient (n=1, 3.2%) was admitted for uncontrolled diabetes with hypertension after delivery for monitoring and further management.

Table 6: - According to the Interventions done before shifting to the ICU

Intervention	Cases	Percentages
Vaginal delivery	02	6.25%
Caesarean delivery	17	53.1%
Laparotomy	04	12.5%
Obstetrics Hysterectomy	02	6.25%
Undelivered	04	12.5%
Hysterotomy	01	3.125%
Laparoscopic suturing of uterine perforation	01	3.125%
B-LYNCH sutures and Step Wise Devascularisation	03	9.375%

Table 6– depicts among 32 patients (n=2, 6.2%) cases delivered by vaginal route, (n=17, 65.6%) cases required caesarean section, (n=4, 12.5%) patients remained undelivered. Laparotomy was done in (n=4, 12.5%) cases for ruptured ectopic pregnancy. Obstetric hysterectomy was done (n=2, 6.2%) cases one for ruptured uterus and one for previous 2 LSCS with placenta previa with accreta with severe pph. Hysterotomy was done in (n=1, 3.2%) case for vesicular mole with low lying placenta. Laparoscopic suturing for uterine perforation was done in (n=1, 3.2%) cases. B-Lynch sutures and stepwise devascularisation was done in (n=3, 9.3%) cases of severe PPH during cesarean section.

Table 7: - According to interventions carried in ICU

Interventions	Cases	Percentages
Intubation & Mechanical Ventilation	05	15.15%
FFP Transfusion	07	21.2%
Blood Transfusion	10	30.3%
Platelet Transfusion	04	12.12%
Mgso4 Therapy	06	18.1%
Cryoprecipitate	01	3.03%
Antiarrthymic drugs and Inotropic support	06	18.1%

Table 7 – shows that (n=5 15.6%) cases required intubation and mechanical ventilation. (n=7, 21.8%) cases were given fresh frozen plasma, (n=10, 31.2%) patient were given blood transfusion, (n=4 ,12.5%) required platelet transfusion. MgSO4 therapy was given in (n=6, 18.7%) cases. Cryoprecipitationn (n=1,3.2%) cases. Antiarrthymic drugs were given in (n=6, 18.1%) cases. Inotropic support was given in (n=6, 18.1%) cases.

Table 8: - Distribution of cases is according to stay in hours in ICU

Duration of stay in ICU	Survivors	Non –Survivors
<24 hours	07	0
25-48 hours	12	0
49-72 hours	05	0
>72 hours	05	3
Total	29	03

Table 8-Shows mean (n=12, 37.5%) of patients stayed for 25-48 hours. (n=5 , 15.6%) cases stayed for longer than 72 hours, of them (n=3 , 9.3%) cases were non survivors. 2 cases due to severe eclampsia with brain infarct developed respiratory failure, hematuria and pulmonary hemorrhage. Second case was eclampsia with sepsis and respiratory failure. Third case was acute on chronic lung infection with previous Kochs infection developed ARDS and succumbed to death. The need for ventilator supports and inotropic support predicted poor outcome.

DISCUSSION

The present study in one of the few studies in recent years, that have been analyzed obstetric patient admission to ICU over a two-year span. Similar study was done by Zwart JJ et al [4]. Crozier TM et al [5]Ghike S *et al*[6]. During this period 32 obstetric patients were admitted to the ICU with an incidence 1.1% of all deliveries comparable to other studies 1.04% -1.4 [6-7]. Mean age of patients in our study was 25+4, which was comparable to study conducted by kilpatrick SJ *et al* [8] 26+_4 and Ghike S *et al*[6]26.05 %.We had 28 patients 87.5 % admitted in the ICU in post partum period. In a study by kilpatrick 66% (8) and Pattnaik 79.62%(9) of the women admitted to ICU were post partum. In our study multi gravida were 18 (56.2%) and primigravida 14 (43.7%) comparable with Mowafy *et al* [10] who reported primigravida around 39.6% and multigravidas were 60.4%.Obstetric causes were the major indication for ICU admission; Vasquez *et al* reported similar study in 2007[11]. In the study by Mowafy *et al* [10] 76.92 % obstetric causes and 34.12% were non-obstetric cause. In our study obstetric cause was 81.25 % and non-obstetric cause was 18.1 % similar to other studies. Bringing out social awareness in patients and improving their nutritional status, teaching them the need for medical and especially the importance of ANC, intranatal and PNC care more so in low socioeconomic group, avoidance of teenage pregnancy can reduce the ICU admissions. In the present study Obstetric hemorrhage was n=14, 43.75% and Hypertension with its complication were n =11, 34.37% which is comparable with Bhatt PBR *et al* [12] Baloch *et al* [13] *et al* Devabhaktuni P *et al* [14] and Bajawa SK [15] *et al*, both are associated with increased risk of maternal morbidity and mortality. Early ANC registration and regular ANC follow up, early admission of patients with complication especially PIH /eclampsia, Proper transport facility and availability of 24 hours blood bank service can prevent ICU admission In the present study dengue fever was seen in 3.2%cases, which is comparable to studies conducted by WenkankarR *et al* [16] 2.35% and Devabhaktuni P *et al* [14] 3.84%. Malaria and dengue prevention and early recognition and treatment during pregnancy and puerperium can be taken.In our study obstetric sepsis was seen in 9.3% of cases comparable with Tempe [1] 7% Tongal [17] 3% and GuptaS [7] 8.33% Sepsis is still one of the leading causes of maternal morbidity and mortality in the developing countries. Early recognition of high-risk cases and appropriate and timely referral, encouraging 100% hospital delivery, mass media education programme, TV, Radio may improve clinical outcome. Other non-obstetric indications were 15.6%, cardiac causes, sever anemia 2(6.2%), diabetes 1(3.2%). Maternal mortality was 3(9.3%), which is comparable with other studies Tongal [17] (12%), Zwart JJ [4] (3.5%), and Croziee [5] had no maternal mortality in this study, as shown in table 9

Table -9: Comparisons with other Authors

Author	Data collected	No of cases	Incidence	Delivery	OBST Hrrage	HTN	SEPSIS	Maternal Mortality
Zwartt[4]	2 yrs	847	1.92-3.2	358874	410 (48.6%)	250 (29.3%)	68(8.1%)	29 (3.5%)
Crozier [5]	2yrs	60	1.45	8151	20 (33.3%)	9 (15%)	6(10%)	0
Present Study	2yrs	32	1.1	2868	14 (43.7%)	11(34.3%)	3(9.3%)	3(9.3%)

The cause of maternal mortality was 9 .3 % in our study, slightly high in our study as two of the three patients were transferred to our hospital in critical condition for further management as our hospital is a tertiary center. 2 patients expired due to sever preeclampsia, eclampsia succumbing to its complication of pulmonary hemorrhage, hematuria and sepsis. Third patient had acute or chronic lung infection, with previous Koch's infection developed ARDS and expired. There was no death due to obstetric hemorrhage due to better early management and round the clock availability of blood bank in our hospital.

CONCLUSION

Prenatal care is one of the best investments a society can make. Every study shows that prenatal care contributes to improved maternal survival and fetal wellbeing. The maternal morbidity and mortality can be avoided by increasing social awareness about teenage pregnancy, early registration, regular ANC follow up, hospital delivery and prophylactic treatment for anemia. Health care unit must be located at appropriate distance; timely screening and interventions in high-risk patients and transfer to certain health care are required. Skillful management of complicated cases by well-equipped medical personnel go a long way to achieve our aims. Finally widespread family planning services should be propagated as a key to success. Continued psychosocial follow-up of discharged patients has to be implemented.

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