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Obstetric Icu Admissions – A Clinical Audit

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ABSTRACT:

BACKGROUND : Care of critically ill parturients is a challenge in obstetrics. Complications may arise during pregnancy or in the postpartum period which can be life threatening and require intensive care. Though obstetric ICU admissions form a small proportion mortality among them is very high. Critical care management of obstetric patients in developing countries is fraught with the problem of poor health care delivery, late presentation of patients and paucity of ICUs.

AIM: The objective of this prospective & descriptive study was to analyze the spectrum of obstetric I.C.U admissions, to identify the common antecedent causes,to analyze the treatment modalities & response ,to study the maternal and fetal outcomes.Study design :This is a prospective study done for 20 months in the department of OBGy –Narayana Medical college superspeciality hospital-a tertiary care centre.The inclusion criteria being all obstetric ICU admissions(booked and unbooked) were evaluated and analyzed.

Statistical analysis : The data was entered in Microsoft excel and analyzed using SPSS software (statistical package for social science ver.10.0.5).Results:6.85% of total deliveries during the study period required ICU admissions. Among them our booked cases were only 11.3% and the rest 88.7% were unbooked cases. 92.5% of ICU admissions were antepartum,and only 7.5% were of postpartum status.The other parameters observed were age,parity, antecedent illness,socioeconomic &educational status ,distance travelled & time taken for ICU admission, therapeutic interventions including maternal & fetal outcomes.**Conclusion:** This study has shown that poverty, illiteracy, lack of awareness,improper antenatal care, non availability of skilled birth attendants, non-existent emergency obstetric care facilities within reach -being responsible for most of the obstetric ICU admissions leading to maternal / perinatal morbidity and mortality.

Keywords: *Obstetric ICU – admissions – outcome-clinical audit.*

Introduction: From times immemorial there have been records of human reproduction and associated complications. The pangs of labour not only results in rejoice but also at times tears of grief. Pregnancy is a physiological condition with a reversible adaptation of the major systems of the

body to the maternal and fetal requirements. But complications may arise during pregnancy, delivery and puerparium resulting in severe maternal morbidity necessitating intensive care unit (ICU) admission.

United Nations (UN) agencies estimate that around 117,000 maternal deaths occur in India each year which make up almost one quarter of the maternal deaths that occur annually worldwide¹. The maternal mortality rate (MMR) is a measure of quality obstetric care. More women die due to pregnancy related causes in India than anywhere else in the world. The concept and development of critical care began in the 1960s. In 1983 the National Institute of Health had its first Consensus Conference on this subject and in 1988 the Society for Critical Care Medicine promulgated definitions and established guidelines for intensive care units (ICUs)². In India roughly one maternal death occurs every five minutes³, accounting for 15% of deaths in women of reproductive age⁴. Data from the most recent National Family Health Survey (NFHS-3) suggest that the maternal mortality ratio has fallen from approximately 400 deaths per 100,000 live births in 1997 to 301 deaths in 2006⁵ but UN agencies put the true number much higher estimating 450 deaths per 100,000 live births⁶. As per WHO, UNICEF, UNFPA and The World Bank estimates, the corresponding Indian figures are shown as MMR of 600 in 1990 which reduced to 200 in 2010 thus categorising India as “making progress” towards improving maternal health⁷.

Care of critically ill parturients is a challenge in obstetrics particularly because of its unpredictability. When complications arise, early intervention and treatment on a multidisciplinary basis in the ICU can alleviate progression of organ dysfunction and improve prognosis. Though obstetric admissions form a small proportion of ICU admissions, mortality among them is very high. Obstetric critical care in developing countries continues to be radically different from developed countries & is fraught with the problem of poor health care delivery, late presentation of patients and paucity of ICUs.

The incidence of parturients requiring critical care support may show a discrepancy depending upon

the care given during the antenatal period and the existence of comorbid conditions. Obstetric disorders account for 55% to 80% of admissions to the ICUs^{8,9}. Although the evolution of critical care for obstetric patients has generally followed developments, there are no specific guidelines. Most hospitals employ a blend of these concepts and in general those can be divided into three types: 1. Medical or surgical ICU-In most hospitals severely ill women are transferred to a unit operated by medical and surgical intensivists. 2. Obstetrical Intermediate Care Unit-Sometimes referred to as High-Dependency Care Unit (HDU). These units are within the labour and delivery suites in specialized areas with experienced personnel available. 3. Obstetrical Intensive Care Unit-These units are full-care ICUs but are operated by obstetrical and anesthesia personnel.

AIMS & OBJECTIVES: A clinical audit of the obstetric ICU admissions in Narayana medical college superspeciality hospital, Nellore- southern India to analyze the spectrum of admissions, to identify the common antecedent causes, treatment modalities and the maternal & fetal outcomes.

MATERIALS AND METHODOLOGY: This is a prospective study done for a period of 1 year 8 months in the Department of Obstetrics and Gynaecology of Narayana Medical College superspeciality Hospital, Nellore, a tertiary care centre. All ICU admissions during pregnancy, delivery and puerperium (upto 42 days postpartum) were evaluated and analysed. The data related to demographics, obstetric history, pre-existing medical problems, indications for ICU admission, interventions required, length of stay and outcome were analysed. The inclusion criteria being all Obstetric ICU admissions (booked and unbooked).

METHODS OF STATISTICAL ANALYSIS: The following methods of statistical analysis have been used. Data was entered in Microsoft excel and analysed using SPSS software (Statistical

package for social science ver 10.0.5). Continuous variables were expressed as means and standard deviations. Discrete variables were expressed as proportions.

On admission patient details viz. name, age, socio economic status including literacy, address, booked / unbooked, whether prehandled by untrained personnel/ health workers/ medical officers/ private nursing home were noted. A detailed documentation of obstetric, medical & surgical histories were noted. In referred cases time, date, place & reasons for referral, distance travelled, time taken to reach our institution along with the use of any medication/blood transfusions are noted. Mode of delivery vaginal /abdominal was noted in postnatal cases. A detailed general, systemic & Obstetric examination done with documentation. Relevant investigations, methods of intervention, type of management according to ICU protocols, duration of ICU stay are noted. The mother & neonate were followed until discharge. The percentage of obstetric ICU admissions compared to total number of deliveries was calculated. The factors contributing to the ICU admissions, maternal mortality/morbidity, fetal outcome like live/still birth/early neonatal death were analysed.

Results: A total of 106(6.85%) cases required ICU admission. Out of these 11.3% were booked & the rest 88.7% were unbooked. Among the unbooked 80.8% were referrals from outside while 19.11% were direct arrivals on their own.

92.5% of total admissions were antepartum & the remaining 7.5% were in postpartum status. The youngest patient admitted was 17 years and 37 years was the other extreme. Mean age being 23.7 with a standard deviation of ± 3.97 . Maximum number of patients were in the age group of 21-25 years (57.6%). 13.2% were in 26-30 years age group. Teenage pregnancies were 21.7% and pregnancies in >30 yrs were 7.5%.

Among the antenatal admissions 58.5% were primigravidae, 38.7% were multiparae and 2.8%

were grand multiparas. Median gestational age was 32 wks (range: 6-40). Among the antepartum cases admitted to ICU 72.5% were of > 28 weeks gestation while 17.3% were of 13-28 weeks and the remaining 10.2% were <12 weeks. 32% of the admitted cases were found to have the educational status ranging from secondary school to graduation. The rest 68% were uneducated and quite unaware of antenatal care. 45.2% of the total ICU admissions were of low socioeconomic status (daily wage labourers), 51% belonging to middle socioeconomic class and 3.8% were of upper class (Kuppuswamy classification of socioeconomic status-2014)¹⁰. Among the referred cases 56.6% were from other hospitals like outside nursing homes (without ICU & blood bank set up), 40.8% were from primary health care centres and the remaining 2.6% were sent by health workers. The distance travelled to reach our hospital ranged between 2 to 83 kilometres. Median distance travelled was 16 kms (IQR, 8-55). 67.9% of them travelled <25 kms, 4.7% 25-50 kms and about 27.4% >50 kms to reach for emergency obstetric care. Time taken to avail emergency obstetric care ranged from <1-2 hrs in 72.6% and >2 hrs in 27.4%. Patients at the time of ICU admissions were found to have: Anaemia (58.9%), dehydration (43.4%), shock (30.2%), breathlessness (23.6%), altered sensorium (20.8%), toxemia (17%) and sepsis (9.4%). Majority of the patients were found to have a combination of the above (REF fig 1).

With regard to the fetal status in antepartum mothers at the time of ICU admission: 45.5% with good cardiac activity, 36.4% with no cardiac activity (IUGR) and 18.1% in fetal distress. 9.4% were ruptured ectopic pregnancies. 7.5% were postpartum admissions and the neonates were in good condition.

The antecedent cause for Obstetric ICU admissions: the commonest was Hypertensive disorders of pregnancy 42.4%, out of which 23.6% were eclampsia and 18.9% were severe

preeclampsia with associated complications like pulmonary oedema, HELLP syndrome, acute kidney injury and hypertensive crisis with cardiac failure. 31.1% were cases of obstetric haemorrhage viz. antepartum haemorrhage (15.1%), postpartum haemorrhage (3.8%), ruptured ectopic pregnancy (9.4%) & uterine rupture (2.8%). Next in order were heart diseases complicating pregnancy (n=12) of which 4.7% were rheumatic heart lesions, 4.7% were peripartum cardiomyopathy, and 1.9% were stuck prosthetic heart valves. Other 6.6% include status epilepticus (1.9%), septic abortion (0.94%), diabetic ketoacidosis (0.94%), pregnancy with ruptured ovarian cyst (0.94%), scorpion sting (0.94%) and post-operative severe hypotension (anaesthetic complication-0.94%).

Labour outcome: 42.45% had normal vaginal delivery. 10.40% cases underwent laparotomy, indications being ruptured ectopic & septic abortion with peritonitis. 36.8% had Caesarean section for various indications. Of three cases of ruptured uterus, Caesarean hysterectomy was done in one patient and rent repaired in two cases. All cases of PPH were managed conservatively with cervical tear repair in one. All cases of eclampsia managed well with Magnesium sulphate but monitored in ICU.

The **most common indications** for ICU admission noted were patient's hemodynamic instability, followed by cardio respiratory insufficiency and altered sensorium. 15% of total admissions needed mechanical ventilation, 40%

needed inotropic support and 8% needed both. 4% of patients with acute kidney injury had Dialysis. About 38% needed blood and blood component therapy.

Total number of patients delivered during ICU stay were 88 (83%), after excluding 10 cases of ectopic pregnancy and eight cases of postpartum status. Among these 55 (62.5%) were live births and 12 (13.6%) still births and Intrauterine deaths were 21 (23.8%). Out of the 55 live births, early neonatal deaths were 7 (8%), cause being prematurity and very low birth weight. 57% of the patients could be discharged within 3 days whereas 3% had to stay > 7 days. Mean duration of hospital stay was 3.55d with a standard deviation of ± 1.19 days.

92% of patients admitted to ICU survived, and the mortality among ICU admissions was 8%. Out of total eight maternal deaths (MMR 7.5%), two (25%) were due to stuck prosthetic valve. HELLP syndrome, sepsis with multi organ dysfunction, status epilepticus and a case of scorpion sting with cerebral haemorrhage have contributed for 12.5% deaths. The remaining two (25%) were due to amniotic fluid embolism. Eclampsia contributed to 21% of perinatal mortality. Placental abruption and severe preeclampsia responsible for 18% each, followed by ruptured uterus (9%). Placenta previa, obstructed labour and septic abortions were the cause in 6%, 6% and 3% cases respectively. Other causes like scorpion sting, status epilepticus etc. contributed to another 18% of PNMR. (REF fig 2)

FIG:1 GENERAL CONDITION OF PATIENTS AT ADMISSION

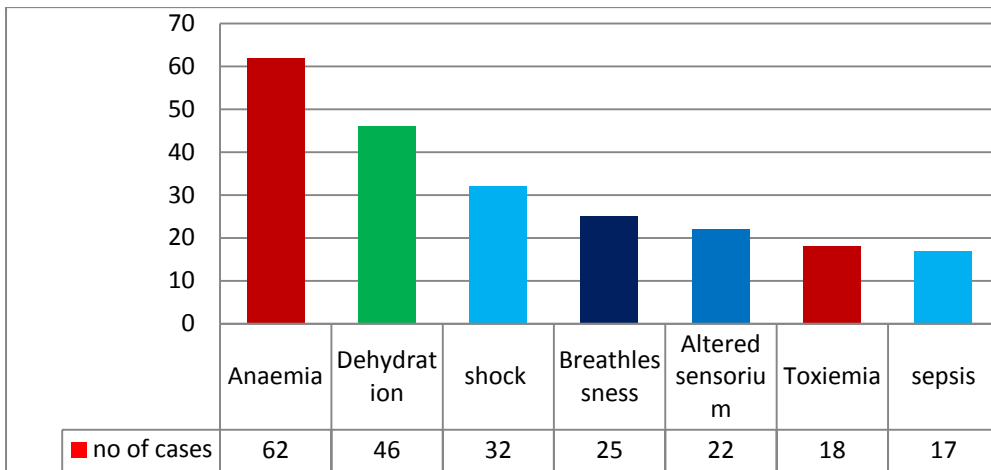
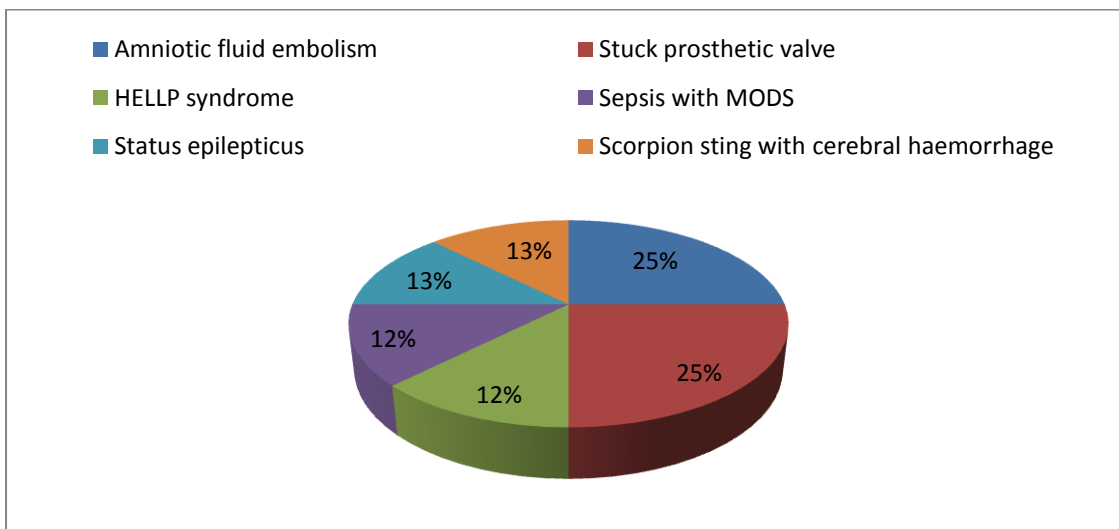


FIG:2 CAUSES OF MATERNAL MORTALITY



DISCUSSION:

The management of critically ill Obstetric patients is complex due to the physiological changes and pregnancy specific diseases that require collaboration between intensivists and obstetricians. Usually these patients are cared for in the general intensive care unit (ICU) as an obstetric ICU is only available in a small number of medical centres in developed countries. The proportions of ICU admissions vary from country to country due to differing protocols. A number of studies have reported the characteristics and outcomes of critically ill Obstetric patients in developed countries, but there is scant literature on this subject in developing countries. Knowledge of Obstetrical critical care is lacking,

and there should be systematic reporting of Obstetric critical care data.

Our study comprising of 106 obstetric ICU admissions is taken up with the concept to analyse the characteristics of admissions, interventions, maternal and foetal outcomes. A clinical audit is planned aiming an ultimate goal to achieve how best to bring down the obstetric ICU admissions in other words how best we can try not to allow any expectant mother to become critically ill.

Obstetric ICU admissions **incidence** varies depending on the admission criteria and the availability of dedicated Obstetric ICU units. Few studies are available in the literature with regard to this in which the % of Obstetric ICU admission were ranging from 0.14 to 0.76. Our study figure of 0.68% in this context is also in par with.

ICU admissions- obstetric vs. non obstetric: Obstetric ICU admissions can be broadly divided into those admitted for obstetric disorders and those for associated medical reasons. According to the available studies majority of ICU admissions are for obstetric reasons. In the present study approximately 79% of the admissions were for obstetric disorders and the remaining 21% were for medical reasons. This is similar to the studies done by Vasquez DN et al. 2007¹¹ and Karnad D.R et al⁸ whose figures are 74% and 69% respectively.

ICU admissions-booked vs.unbooked: With regular antenatal check-ups the booked cases would be sensitized to various complications associated with the obstetric and non obstetric disorders that may develop in the course of pregnancy, as a result they will be able to identify such complications and report early compared to the unbooked cases admitted later when the condition is critical. In our study the booked cases needing the admission to ICU were 11% only which is very much differing with the figures of Gupta et al¹²(79.16%). The very low % of booked cases in our study may be due to the fact of enhanced public awareness in our areas along with the effective health care delivery system in our hospital. Our observation is comparable to a study done by Roohina b aloch et al. 2010¹³ in which unbooked cases were 84.2% our figure in this context is 89%.

ICU admissions-antenatal vs postnatal: In contrary to many available studies our antenatal admissions were high with very low % of postpartum admissions (92.5 vs 7.5). Our antenatal admission % is correlating with that of Collop &

Sahn et al¹⁴. Vowing to the predominance of hypertensive disorders in our antenatal population this could be attributed to the unexpected course of the disease during pregnancy because of various contributing factors, While obstetric haemorrhage is the major cause for high postpartum ICU admissions in other studies (Ebirum and Ojum(2012)¹⁵ & Selo- Ojeme et al.(2005)¹⁶. This disparity in the antenatal and postpartum ICU admissions may also be attributed to differing ICU admission policies in different centres.

ICU admissions – age distribution: Child and Adolescent marriage is linked, both directly and indirectly to maternal death and morbidity worldwide. An estimated 50% of maternal deaths in India occurs before age 25. Age at marriage and thereby age at pregnancy also contributes for the pregnancy outcome. In our study most of the pregnant mothers admitted to intensive care units were in the age group of 21-25 years (58%), the mean age at admission being 23.7 ± 3.97 yrs which is in par with the available study figures. The mean age (31 ± 6) in the study of Leung et al¹⁷ might be due to late age at marriage in women who are career oriented.

ICU admissions-parity distribution: Parity also contributes significantly to maternal mortality and morbidity because of the increased incidence of associated complications as the parity increases. In our study 58.5% were Primigravidae, multiparous women (P2-P4) 38.7% and Grand multiparas were 2.8%. Ebirum and Ojum¹⁵ in their study had primigravidae constituting 65% and multigravidas 43% of 108 admissions in a 5 year period. In our study the predominant cause for ICU admission is found to be hypertensive disorders of pregnancy which is more prevalent among primigravidae thus justifying their high percentage.

ICU admissions –period of gestation: As most of the pregnancy associated complications begin during and after the second trimester, the obstetric

ICU admissions are expected to be more in this gestational age. It was observed that 71% of the antenatal women admitted to the ICU were above 28 weeks of gestation, with a median gestational age of 32 weeks (range 6-40 weeks). This is similar to the results obtained by Karnad et al⁸ (mean GA 31 weeks), Roohina Baloch et al¹³ (mean GA 33.1±7.06).

ICU admissions -literacy and socioeconomic status: 68% of our patients were illiterates and the rest 32% were having moderate to high education. This observation is in contrast to a study done by Gupta et al. (2011)¹³⁵ in which 45% women were educated. A study done by Vora KS et al. (2009) in India, showed that only 18% illiterate mothers had institutional deliveries compared to 86% of mothers with 12 or more years of education.

A higher incidence of mortality and morbidity is found to occur among women who are poor and belong to socially disadvantaged castes and tribes. The affordability of reproductive health services for women is a major concern. The burden of high out-of-pocket expenses for reproductive health care has been identified as a leading cause of poor reproductive health outcomes among low-income women. Hospitalization is frequently a cause of debt among the poor women which in turn leads to increased poverty. In terms of barriers faced specifically by poor women to maternal health care, studies point to their increased likelihood of receiving a lower quality of care than rich women which serves as a deterrent against seeking institutional health care leading to higher risk of pregnancy related complications and mortality. In our study, about 45% of women were of low socioeconomic status & the high incidence of severe Pre eclampsia and Eclampsia in these women reflect the inability of the public-health system to reach out to the poor and illiterate, who were unaware and incapable of recognizing potential danger signs during pregnancy which also explains their critical status at admission.

Distance travelled and time taken to reach hospital: In critical situations, delay in accessing the available medical care can be attributed to factors such as non-availability of emergency obstetric care centres nearby. Impassable roads or lack of transportation options prohibit women from promptly gaining access to an existing facility. In a study done by Gupta et al 33% of women travelled > 50kms to reach emergency obstetric care and about 67% <50kms, whereas in our study the corresponding figures are 27% & 73% respectively. This definitely adds to the deterioration of prognostic scoring.

General condition on ICU admission: General condition at the time of ICU admission is a definite reflection of the future prognosis. In almost all the cases, the patients at the time of ICU admission were found to have considerable haemodynamic instability which can be attributed to the delay in deciding to seek care and delay in referrals from the outside hospitals (PHC & NH). In the study by A khatoun et al. (2011)¹⁸ 35% of patients were unstable and critically ill at the time of admission whereas in our study the corresponding figure is 42%. In our study, reasons for delay in referrals were noticed to be due to incapacity of birth attendants to identify the warning signs of seriousness in individual cases and the nonavailability of ICU setup & blood bank facilities in some private nursing homes. Other reason is the non availability of male family member at home because of job situation. Financial constraints are another issue for seeking medical care in time.

Spectrum of ICU admissions-nature of illness: Analysis of obstetric ICU admissions provides some insight into the nature of obstetric illnesses requiring critical care. Data were pooled from **18 published studies**¹⁹ that provided sufficient details about primary indication for ICU admission.

TABLE:1 SPECTRUM OF ICU ADMISSIONS:

Category	Category examples	Published studies(%)	Present study
Hypertensive disorders	Eclampsia, Severe preeclampsia, HELLP syndrome, hypertensive Crisis	30.8	42.5%
Haemorrhage	Shock, abruption, praevia, postpartum haemorrhage, Rupture uterus, ectopic pregnancy.	20.3	31.1%
Pulmonary	Pulmonary oedema, adult respiratory distress syndrome, Asthma, thromboembolic diseases, amniotic fluid embolus.	13.0	-
Cardiac	Valvular disease, arrhythmias, cardiomyopathy, infarction.	7.0	11.3%
Sepsis/infection	Chorioamnionitis, pyelonephritis	6.7	0.94%
Central nervous system	Seizure (noneclamptic), intracranial haemorrhage	3.2	1.9%
Anaesthesia complication	Seizure (noneclamptic), intracranial haemorrhage	3.2	1.9%
Renal	Renal failure	1.7	-
Haematological	Severe anaemia, Thrombotic thrombocytopenic purpura, disseminated intravascular Coagulation	1.3	4.7%
Endocrine	DKA, thyroid storm.	1.1	0.94%
Others	Insufficient information to assign to specific organ system.	9.1	5.68%

It is evident from the available studies that hypertensive disorders with associated complications and obstetric haemorrhage were responsible for 50% of obstetric ICU admissions. Specific organ system dysfunction was responsible for the majority of remaining cases. In our study also, hypertensive disorders stood first, contributing to 42.5% of all ICU admissions. Next

in order are cases of major obstetric haemorrhage contributing to 31%, thus our results are found to be running in par with those studies.

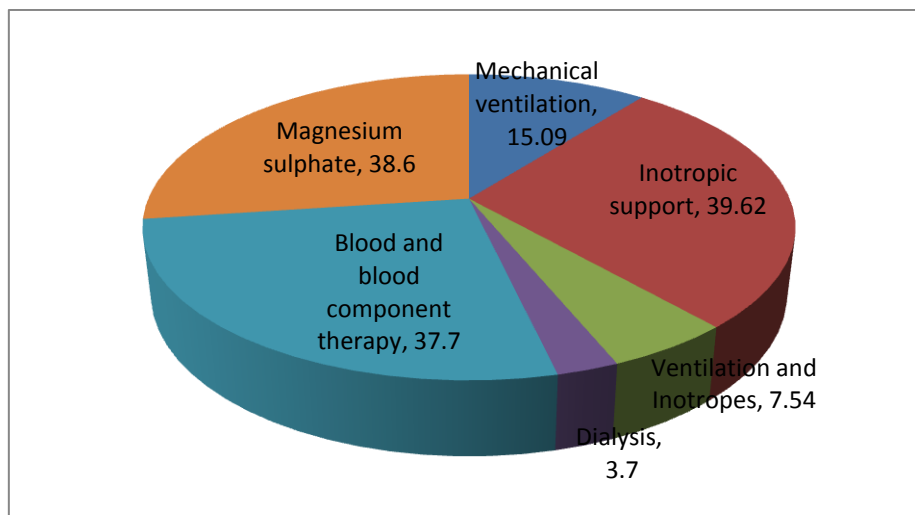
Antenatal ICU admissions -labour outcome: Most of the time the definitive treatment for antenatal ICU admissions will be pregnancy termination. Pregnant uterus itself may interfere with active interventions in critically ill expectant

mothers. Time factor is very important in the management of antenatal ICU admitted cases. Prompt delivery prevents further decompensation caused by pregnancy itself. Therefore, pregnancy termination by emergency Cesarean section is expected to be the dominant mode of delivery. Our figures in this pretext are 40%. Next in order of frequency are vaginal deliveries 33% (induced/spontaneous), while instrumental del. being confined to 8.5%.

Interventions during ICU stay: Hemodynamic instability was found to be the most common cause for obstetric ICU admissions. Inotropic

support was required in majority thus proving the most frequent finding of haemodynamic instability in these patients. In our study also the haemodynamic instability was the major cause for ICU admission requiring inotropic support in 40%, ventilatory support in 15%, & 7.5% needed both. 3.8% needed dialysis for acute kidney injury. Blood transfusions were required in 38% for correction of anaemia and for volume replacement in cases of obstetric haemorrhage (REF fig 3). Poor nutritional status, antepartum and postpartum haemorrhages lead to anaemia in these patients

FIG:3 ICU ADMISSIONS - TYPES OF INTERVENTIONS REQUIRED



Duration of ICU stay: Duration of ICU stay directly or indirectly indicates the seriousness of patient's condition at the time of arrival and the amount of damage already done because of various factors as mentioned before. The mean duration of ICU stay in reported studies is ranging from 3.30 ± 2.07 to 4.6 ± 7.5 days. The figure in our study was 3.53 ± 1.19 days. Three cases in the present study were kept for >7 days in the ICU viz., a case of HELLP syndrome, septic abortion with uterine perforation and acute kidney injury in a case of Eclampsia. All these three cases were referred from outside and were in bad shape at the time of arrival. There was bowel perforation in septic abortion case mismanaged by an RMP. This

obviously indicates a direct proportion between patients condition at arrival and duration of ICU stay.

ICU ADMISSIONS-maternal outcome: At the end of the day, it is the maternal outcome that mainly reflects the efficacy of obstetric ICU care. High maternal mortality rates in many countries results from poor reproductive health care, including non access to vigilant antenatal care and supervised childbirth. Our maternal mortality figure of 7.5% is considerably low compared to studies of Gupta¹² (41.6%) and ebirum¹⁵ (40.7%). In our study, eight maternal deaths were reported in which two were due to amniotic fluid embolism, other two were due to stuck prosthetic valves and

the remaining four were due to HELLP syndrome, status epilepticus, sepsis and scorpion sting with cerebral hemorrhage respectively. There was only one (12.5%) maternal death (?amniotic fluid embolism) among booked cases the rest were all unbooked (87.5%). The significantly low percentage of mortality rate among the booked cases could be attributed to close monitoring, early recognition of warning signs, timely ICU admission cum effective therapeutic interventions. The maternal deaths among the unbooked ICU admissions may be due to their moribund status and irreversible damage that must have occurred by the time of admission itself resulting in failure to be revived despite effective management.

FETAL OUTCOME: When an expectant mother is critically ill in ICU, apart from maternal welfare the clinicians are expected to have an insight into fetal condition. All interventions though mainly meant for favourable maternal outcome, good fetal outcome is also equally important. In the available two studies, the perinatal mortality was ranging between 8% and 52% (Leung et al¹⁷, Karnad et al⁸). In our study the perinatal mortality is around 38%. Among live births also 8% babies died due to prematurity and very low birth weight. As the perinatal mortality figures are varying in different studies, a cut off line cannot be drawn unless otherwise the studies are made under identical conditions.

CONCLUSIONS

This study has shown that poverty, illiteracy, lack of awareness, improper antenatal care, non-availability of skilled birth attendants, non-existent emergency obstetric care facilities in remote areas being responsible for most of the maternal and perinatal morbidity and mortality. This study also reveals that women do try to reach adequate health services when an emergency occurs, but there are many obstacles faced that delay this process.

Hypertension-related complications and massive obstetric haemorrhage are the leading causes of obstetric admissions to intensive care units in the present study. The admission rate to intensive care and the problems faced by critically ill parturients may be reduced by improving the management of

hypertensive disorders during pregnancy and by reducing the prevalence of haemorrhagic complications by emphasis on early detection and anticipation. It should come as no surprise to personnel providing obstetric care that pregnancy complications are unpredictable, and therefore all units should plan for any inevitable complications that may occur in course of pregnancy. Such preparedness may involve drills, drug and management guidelines, provision for massive blood transfusion and availability of equipment. None of this is difficult to achieve and does not require expensive or technically advanced equipment. Apart from preparing for complications that will inevitably occur it also requires the will to audit local morbidity & practise. Much can be achieved with proper organisation and appropriate use of available resources

Every obstetric unit should be able to provide initial critical care for obstetric emergencies. Management of these emergencies should be a team work. Only prompt and appropriate interventions can avert the catastrophe of death. A better scoring system especially applicable to the critically ill obstetric patients in the Indian scenario could lead to accurate monitoring of quality care and risk stratification for clinical and therapeutic trials.

According to World Health Organisation (WHO), "There is a story behind every maternal death or life-threatening complication. Understanding the lessons to be learnt can help avoid such outcomes"²⁰. Periodic clinical auditing is mandatory to assess our standards with regards to delivery of quality care.

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