

## Profile of obstetric patients requiring ICU care

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### Abstract

**Aims and Objectives of study:** The aim was to study incidence, indications and immediate outcome of obstetric patients admitted in ICU, to assess morbidity and mortality of these patients and to assess risk factors leading to ICU admissions.

**Methods:** In this cross sectional study, from January 2009 to July 2010, 102 obstetric patients were analysed for critical illness for ICUs (medical and surgical) admissions the Descriptive analysis study was done considering Total Obstetric Admissions (Antenatal, intra and Postnatal including Abortions) in ICU, residence, Indications of ICU Admission, Mean SOFA scores on various days of ICU stay, requirement of blood components and maternal mortality during ICU stay were studied. Cross tables and frequency tables with percentage, correlation and regression and statistical analysis were performed using statistical package for social sciences (SPSS 16.0).

**Results:** This is a study of 102 obstetric ICU cases out of 2386 antenatal, intranatal and postnatal admissions including abortions from January 2009 to July 2010. The incidence of obstetric ICU admissions was 4.2%. Mean SOFA score on day 1 of survived patients was 9.2% and expired patients was 13.1, on day 3 mean SOFA Score of survived patients was 6.2 and expired patients was 7.7 and on day 5 mean SOFA Score of survived patients was 3.2 and expired patients was 5.3.

**Conclusion:** The severe maternal morbidity: mortality ratio is a possible new indicator of maternal care and more accurate than mortality data alone. Currently, our top priority are mainly two from this study. Early detection and treatment of anemia and control & treatment of hypertension will reduce large number of maternal and fetal deaths. At present, we must concentrate on anemia, hypertension and medical disorders in pregnancy (CCF, Jaundice, R S dysfunction including H1N1, AIDS etc.).

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### Introduction

The medical and obstetrical complications in critically ill pregnant patients significantly contribute to high maternal mortality and morbidity including near miss cases. This can be taken care only if the interactions between altered physiological state of pregnancy and adverse patho-physiological state of severe diseases are clearly understood and prompt, anticipatory, careful and complete interventions are provided by a dedicated team of multi-speciality in well-equipped infrastructural set up.

### Material and Methods

In this study we used the definition of critical illness as "Any obstetric patient admitted in critical care unit irrespective of diagnosis of patient".

This study was a cross sectional study and we analysed all obstetric admissions to ICU (medical and surgical) of Shree Krishna Hospital and Pramukhswami Medical College, having tertiary care facilities. Study was carried out on 102 obstetric patients for 1½ years from January 2009 to July 2010 in reproductive age group 15-45 years. The obstetric patients who had

medical and surgical complications during antepartum, intrapartum and postpartum period requiring ICU admissions were included in the study. Patients and their relatives were briefed about the purpose of study and their informed consent was obtained. Data included demographic details, obstetric details and medical & surgical complications, which was verified by various statistical tools. Excluded those patients who had no critical complications, pure surgical illness and patients who had not completed treatment in the hospital e.g. LAMA.

Detailed history of the patient including symptomatology, menstrual and obstetric history, medical and surgical illness, and relevant details obtained. Complete physical examination including the obstetric and gynaecological examination was done by physician and obstetrician. The scoring system which is used in this study is to quantitate the sequence of complications in our patients. The SOFA Score developed by the European Society of Intensive Care Medicine was used to quantitate the sequence of complications in critically ill patients. This gave us idea whether involvement of number of organs was increasing or decreasing and if the severity of particular organ was increasing. This SOFA score which will measure the dysfunction in six organ system viz Respiration, coagulation, liver, cardiovascular, CNS and Renal function is given in table no 1. The minimum SOFA Score was 0 and maximum was 24. The worst parameter of the day was considered and score calculated on day 1, 3 and 5. Mean arterial blood pressure was calculated using following formula. MAP:

(2 x diastolic pressure) + systolic pressure / 3. Normal value 70-110. Modified GCS Score: The modified GCS score was also calculated which was useful for neurological assessment and also a part of APACHE II and SOFA score. It took into consideration verbal, eye and motor component. The minimum score was 3 and maximum was 15 suggesting a fully conscious state. The score is given in Table 1.

Each of the patient based on clinical diagnosis & situation will undergo laboratory and other invasive or non-invasive investigations including blood, urine, other specific body fluid examination, ECG, ECHO, sonography, X-ray, CT scan etc., as and when required and results will be obtained. Therapeutic details including indication of ICU admission, types of antibiotic to be used, ventilator details, all possible obstetric interventions, blood products use, will be noted for each patient. The patients critical illness (e.g. haemorrhage) and the complications that prompt ICU admission was recorded separately. Treatment: After admitting the patient in MICU, central venous access was established and aggressive fluid therapy was started depending upon cardio-respiratory condition of patient. Antibiotics were started empirically, vasopressors if fluid therapy was not successful through CVC, ventilator therapy for lung involvement, dialysis for ARF, blood products as per the clinical profile was initiated. Supportive measures in form of nutrition (preferably enteral), tight glycemic control, correction of electrolyte and acidosis were also given. Anti-malarials in suspected cases were started empirically also because of high endemicity. Any surgical intervention in form of caesarean section, laprotomy and obstetric hysterectomy/hysterotomy were performed. In this study we will use and apply different statistical tools to analyse data as per requirement; like Descriptive analysis (mean, standard deviation, standard error of mean, odd's ratio, confidence interval and range), cross tables and frequency tables with percentage, correlation and regression and statistical analysis were performed using statistical package for social sciences (SPSS 16.0). Differences between groups were identified using the chi square test; significance was defined as  $p < 0.05$ .

## Results

This is a study of 102 obstetric ICU cases out of 2386 antenatal, intranatal and postnatal admissions including abortions from January 2009 to July 2010.

The incidence of obstetric ICU admissions was 4.2%. Out of total, 1195 cases in MICU, 55 cases (4.6%) were obstetric ICU admissions and out of total 908 cases in SICU, 47 obstetric (5.15%) were in SICU. Of 102 cases, 92 cases (90.2%) were referred from medical officers and consultants and 56 cases (54.90%) had not taken ANC. Maximum number of patients 40 cases (39.21%) came in intranatal period as compared with antenatal 24 cases (23.54%) and postnatal 38 cases (37.25%), 26 cases (68.43%) were admitted on 1<sup>st</sup> PPD. Out of 62 deliveries, 38 cases (61.29%) were delivered vaginally, 18 cases (29.03%) required CS, and in one case (1.61%) hysterectomy was done. Of the 24 cases who expired, 12 deaths (50%) were associated with severe anemia. Out of 47 cases of pregnancy with hypertension, 15 cases (14.70%) had eclampsia. There were 13 deaths (12.7%) from hypertensive disorders of pregnancy including two deaths (13.3%) from eclampsia. Most common cause of obstetric haemorrhage was postpartum haemorrhage (14 cases-73.68%). Out of 24 cases of CCF, 14 cases (58.33%) were peripartum cardiomyopathy, eight cases (33.33%) were due to severe anemia and two cases (8.3%) were due to severe PIH. The common medical disorders were cardiac 19 cases (18.62%), respiratory diseases 4 cases (2.92%) and miscellaneous 4 cases (3.92%) as for example snake bite (1 cases) and anaesthetic complications (3 cases). Mean SOFA score on day 1 of survived patients was 9.2 and expired patients was 13.1, on day 3 mean SOFA Score of survived patients was 6.2 and expired patients was 7.7 and on day 5 mean SOFA Score of survived patients was 3.2 and expired patients was 5.3. There were 24 maternal deaths (23.5%) out of 102 ICU patients. The main causes of deaths were hypovolemic shock due to obstetric haemorrhage in 7 cases (29.16%), MODS in 6 cases (25%), respiratory failure in 4 cases (16.68%), cardiac cases in 3 cases (12.5%), ICH and very severe anemia 2 cases (8.3%) each. The Maximum deaths occurred within 3 days of ICU admission i.e., in 21 cases (87.52%). Of 61 births, 27 (44.54%) were live and 34 (55.53%) were still born. No neonatal death occurred. The common causes of SB were Severe PET/eclampsia and obstetric haemorrhage in 20 cases (62.5%). NICU admissions required in 14 cases (51.86%) mainly because of mother was unstable in 8 cases (57.14%), septicaemia 3 cases (21.52%), LBW in 2 cases (14.2%) etc.

The Sequential Organ Failure Assessment(SOFA) score					
	SOFA				
	0	1	2	3	4
Respiration PaO2 /FIO2(torr)	>400	≤400	≤300	≤200 With respiratory support	≤ 100 With respiratory support
Coagulation Platelets (×10 <sup>3</sup> /mm <sup>3</sup> )	>150	≤150	≤100	≤50	≤20
Liver Bilirubin(mg/dl)(μmol/L)	<1.2 <20	1.2-1.9 20-32	2.0-5.9 33-101	6.0-11.9 102-204	>12.0 >204
Cardiovascular Hypotension	No Hypotension	MAP <70 mm hg	Dopamine ≤5 or dobutamine(any dose)	Dopamine ≤5 or epi ≤ 0.1 or norepi = 0.1	Dopamine >15 or epi > 0.1 or norepi > 0.1
Central Nervous System Glasgow Coma Score	15	13-14	10-12	6-9	<6
S.Creatinine or urine output (ml/day)	<1.2 <110	1.2-1.9 110-170	2.0-3.4 171-299	3.5-4.9 300-440 or <500mL/day	>5.0 >440 Or <200ml/day

**Table 2: Percentage of ICU Cases**

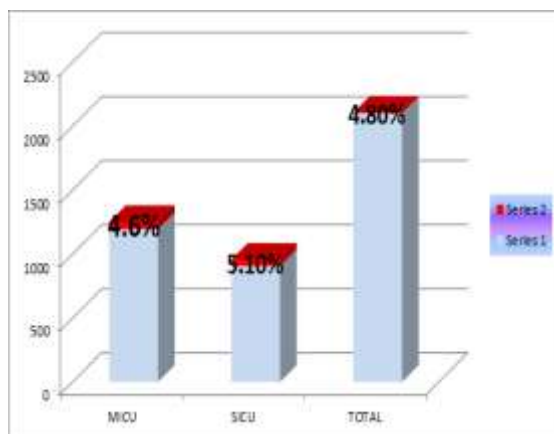
	Total no of cases	Percentage
Total Obstetric Admissions (Antenatal, intra and Postnatal including Abortions).	2386	
Total ICU (Obstetric) Admissions	102	4.2%

**Table 3: Reflects ICU utilisation rate of obstetric ICU cases were 4.6% in MICU and 5.1% in SICU respectively**

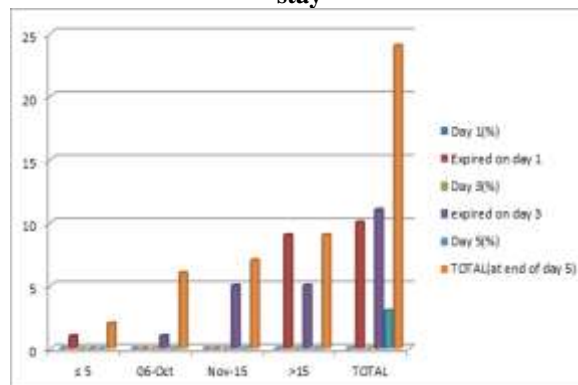
SOFA Scores	Maternal outcome	Mean	Std. Error Mean
Day 1	Survived	9.2857	1.74227
	Expired	13.1667	1.40865
Day 3	Survived	6.2597	1.77776
	Expired	7.7826	1.85859
Day 5	Survived	3.2468	1.30239
	Expired	5.3913	1.61238

**Table 3: Percentage of Obstetric ICU admissions in MICU and SICU**

Type	No. of cases	Percentage
Antenatal	24	23.54
Intranatal	40	39.21
Postnatal	38	37.25
Total	102	100



**Table 4: Mean SOFA scores on various days of ICU stay**



**Table 5: Maternal Mortality**

Maternal outcome	No of cases	Percentage
Recovered	78	76.47
Death	24	23.53
Total	102	100

## Discussion and Observation

Table 2 reflects that Total obstetric admissions were 2386 which includes Antenatal, intranatal and Postnatal admissions and spontaneous abortion cases, of which 102 were ICU admissions giving an incidence of 4.2%, during study period.

Above data indicates that, on admission(day 1) mean SOFA score of survived patients was 9.2 and of expired patients was 13.1, those who expired had higher score. However, there was no significant difference in mean SOFA score on Day 3 of admission of survived and expired patients. And on day 5 mean SOFA scores of survived patients was 3.2 and expired patients was 5.3 which shows that due to irreversible multi-organ failure patients expired on day 5, so their mean SOFA Score was high.

Table 5 depicts that, inspite of having very good facility in MICU and SICU we could not save 24 mothers (23.5%). Our centre caters very high risk and moribund patients at a very late stage maximum patients died at our centre.

The deaths are caused by the “delay in seeking care, delay in reaching care and delay in receiving care.”

The authors declare no conflict of interest.

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