



Research Paper

A Study of the Spectrum of Critically Ill Obstetric Cases Admitted in Medical ICU in Central India

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Abstract

Background: Maternal mortality is an important public health problem especially in backward states of India like Madhya Pradesh. Obstetric cases may also have serious medical causes of morbidity and mortality which maybe preventable. The knowledge of their spectrum may help in instituting steps for their prevention.

Aims: To study the spectrum of critically ill obstetric cases admitted in Medical ICU in Gwalior.

Methodology: This is a prospective observational study conducted among obstetric patients admitted to Medical ICU between January 2017 to September 2018 in a medical college in Gwalior.

Results: A total of 100 consecutive cases were studied and the mean age of the subjects was 24 years. 62 % of the patients were ANC and 38% were PNC. Majority of the ANC patients were multigravida (58.03%). Most common diagnosis in the present study was Severe Anaemia (31%). Overall mortality was 13% with overwhelming majority having a qSOFA score ≥ 2 ($P < 0.001$). Most common cause of mortality in present study was Hepatic encephalopathy (53.84%) followed by Severe anaemia with sepsis (30.77%). Most common interventions required were packed RBC transfusions (67%), followed by mechanical ventilation (12%) and inotropic support (12%).

Conclusion: The qSOFA score was found to be an important tool in predicting mortality. Most common diagnosis was Severe Anemia and the most common cause of mortality was Hepatic encephalopathy (due to viral hepatitis). Packed RBC transfusions, mechanical ventilation and inotropic support were the commonest interventions required. Thus the causes of morbidity and mortality in this crucial subset of patients can be tackled by effective public health measures in our study population.

Keywords: Obstetric patients, Medical ICU, qSOFA score.

Introduction

A critically ill obstetric patient is one who, due to normal or abnormal pregnancy, delivery, and puerperium, or due to the effects of systemic disease, develops life-threatening complications for which she require intensive monitoring,

treatment or life support system.

A pregnant woman is usually young and in good health until she suffers from some acute insult, her prognosis would be better if she receives timely and adequate intensive care, than that of most other patients admitted to a critical care unit.

"Maternal deaths" are defined by the WHO as the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and the site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management but not from accidental or incidental causes.

Baskett T F et al in 1998 studied the obstetric patients requiring ICU admission over a time frame of 14 years.¹The study concluded that the main indications for maternal transfer to intensive care unit are medical disorders, sepsis along with hypertensive disorders and hemorrhage.

It is found that 72% of maternal deaths can be prevented through effective and adequate antenatal care. However, as most of the obstetric emergencies are unpredictable and 15% of all pregnant women can develop life-threatening complications, antenatal care alone will not prevent all the maternal deaths. Thus, it is the combined effort of antenatal care and intensive obstetric care that is essential for reducing maternal mortality.

In view of this, the present study try to make an attempt to study these disorders threatening the lives of both the mother and the child.

Aims and Objectives

The aims of this study were

- To study the cases requiring medical intensive care unit (MICU) transfers among critically ill obstetric patients
- To study the qSOFA score and its correlation with mortality.

Material and Methods

Study Area: This study conducted in Department of Medicine, G.R. Medical College & J.A. Group of Hospitals, a tertiary care hospital, in Gwalior, India.

Sample Size: The study comprised 100 patients admitted in Department of Medicine, J.A. Group of Hospitals.

Methodology: In all the cases written inform consent was obtained from each subject. The

patients were admitted in the Medical ICU and a thorough history and physical examination was done. All routine investigations like CBC, LFT, RFT, RBS, Serum electrolyte were done. USG abdomen was also done. The patients were given symptomatic and supportive treatment. Interventions like packed RBC transfusions, FFP transfusions, inotropic support, hemodialysis and mechanical ventilation were done as needed. Specific treatment was given to some patients.

Inclusion Criteria

- All cases of pregnancy related complications requiring Medical ICU Admission.

Exclusion Criteria

- All Non obstetric or Gynecological cases admitted in Medical ICU.
- Subject who do not provide consent for the study.

Observation and Results

- This study conducted in Department of Medicine, G.R. Medical College & J.A. Group of Hospitals, Gwalior, a tertiary care hospital on 100 cases from 2016 -2018.
- Majority of the patients were ANC (62%) followed by PNC (38%). Majority of the ANC patients were multigravida (58.03%) followed by primigravida (41.93%).

Table 1: Age group distribution

Age group	Frequency
15 – 20	14
20 – 25	48
25 – 30	31
30 – 35	4
35 -40	3
Total	100

Mean age of 100 subjects was 24 years. Maximum number of subjects were of age group 20 to 25 (48%) followed by 25 to 30 (31%).

Table 2: Blood profile values

Blood profile	Mean	SD	Min	Max
Hb (g/dL)	7.06	2.63	2.2	15
TLC (in cells/ mm ³)	9251	5958.36	2300	36000
Polymorphs (in %)	70.88	11.19	41	93
Lymphocytes (in %)	24.73	11.26	5	54
Platelets (in Lakhs / mm ³)	1.61	0.77	0.4	4.4
RBS (in mg / dL)	89.17	27.99	49	206

Mean Hb, TLC, Polymorph cells, Lymphocytes, Platelet and RBS were 7.06±2.63 gm%, 9251±5958.36 cells / mm³, 70.88±11.19 %, 24.73±11.26 %, 1.62±0.77 lakhs / mm³ and 89.17±27.99 mg/dL respectively.

Table 3: Diagnosis

Diagnosis	Frequency	Percent
Severe Anaemia	61	61
Infections	15	15
Dengue fever	1	1
Enteric fever	1	1
Pneumonia	6	6
Malaria	4	4
Pulmonary tuberculosis	2	2
Meningitis	1	1
Acute Viral Hepatitis, Hepatic Encephalopathy	11	11
Acute diarrhoeal illness, Acute Kidney Injury	10	10
Datura poisoning	1	1
Choriocarcinoma	1	1
Cerebral Venous Thrombosis	1	1

Most common diagnosis in present study was Severe Anaemia (31%) followed by Severe Anaemia with Urinary Tract Infection (6%) and Severe Anaemia with Sepsis (5%).

Table 4: Interventions required and Mortality

Interventions required		Numbers	Mortality in those undergoing intervention (in%)
Blood transfusion	PRBC	67	11
	FFP	9	77
Inotropic Support		12	75
Mechanical Ventilation		12	100
Dialysis		3	0

Table 5: Causes of Mortality

Causes	No of patients (n=13)	Percentage
Hepatic encephalopathy	7	53.84
Severe anaemia with sepsis	4	30.77
Pyogenic meningitis with sepsis	1	7.7
Dengue fever with sepsis	1	7.7

Most common cause of mortality in present study was Hepatic encephalopathy in 7 (53.84%).

Table 6: qSOFA score and mortality

q SOFA	Survived	Mortality
0 or 1	62	1
≥2	25	12

Majority of the patients had qSOFA (Sequential Organ Failure Assessment) score of 1(63%) followed by ≥2 (37%). 12 of the 13 mortalities recorded had a qSOFA ≥2. This showed that higher the qSOFA score is directly linked to higher mortality (P < 0.001).

Discussion

Regardless of the therapeutic advances of the last century, maternal morbidity and mortality continue to occur (Tempe A et al, Osinaike B et al).^{2,3} In this study we have tried to find out the medical (non-obstetric) causes of the same in our population.

Mean age of 100 subjects was 24 years. Maximum number of subjects were of age group 20 to 25 (48%) followed by 25 to 30 (31%). Chawla Setalin a similar study reported that the age of the patients ranged from 18 to 37 yrs and majority of the patients were between 20 and 30 yrs of age.⁴ In a similar study by Devabhaktuni P et al reported that the mean age of these patients was 26 ± 5 years.⁵

Mean HB, TLC, polymorph cells, lymphocytes, platelet and RBS was 7.06±2.63 gm%, 9251±5958 cells / mm³, 70.88±11 %, 24.73±11%, 1.62±0.77 lakhs / mm³ and 89 ±27 mg/dl respectively. Thus, rates of anemia and sepsis were very high in our study.

The most common cause of ICU admission in our

setup was severe anaemia (63%), followed by jaundice (16%). There were also cases of acute diarrhoeal illness presenting with hypovolemic shock to our ICU. A single case of datura intoxication was also present. In a study by Chawla S et al on the spectrum of diseases in an obstetric population resulting in admission to the ICU, pre-eclampsia and its complications were the most common primary diagnosis in the patients (48.5%) followed by obstetrical hemorrhage (31%).⁴ In a study by Bibi Setalpre-eclampsia, sepsis and obstetric hemorrhage were the indications for critical care in 26%, 26% and 20% of obstetric patients respectively.⁶ These were the studies conducted mainly on patients admitted in obstetric ICU setup. As our study was conducted in a strictly medical ICU, the diagnoses were vastly different. No similar studies to ours were found in literature.

In present study, 4 major types of interventions were required in the ICU: PRBC transfusions (67%), Mechanical Ventilation (12%), Inotropic support (12%) and Hemodialysis (3%). 9% also required FFP transfusions.

In case of transfusions, while in PRBC transfusions 59 (88.05%) subjects showed improvement and only 8 (11.94%) had expired, in patients in whom FFP was transfused only 2 (22.3%) had improved and 7 (77.77%) expired. While Niyaz et al and Devabhaktuni P et al reported a similar rate of Blood and blood products requirement of 56% and 50% respectively,^{5,7} as high as 86.8% have also been reported (Gupta M et al) in some settings with predominantly obstetric diagnoses.⁸

In our study 12% of the patients required ventilatory support and it had 100% mortality. 12% also required inotropic support, and this intervention entailed 75% mortality. It has been observed that hemodynamic and respiratory complications needing inotropic or ventilator support remain the most common reasons for ICU admissions and may predict a poor outcome. (Vasquez DN et al, Kilpatrick SJ et al, Bhadade R et al).^{9,10,11} While Gupta M et al (89%) and Niyaz

et al (85%) reported high rates of mechanical ventilation requirement,^{7,8} Sriram et al (61%), Devabhaktuni P et al (51%) and Chawla S et al (46%) reported moderate numbers.^{4,5,12} Our study probably had lesser numbers due to exclusion of strictly obstetric reasons of admissions in our ICU. Inotropic requirements were much lesser in other studies too - 38% (Sriram S et al) and 35% (Chawla S et al)^{4,12}.

In our study only 3% patients required hemodialysis. Devabhaktuni P et al (19.9%) also reported a low figure.⁵ It was not associated with mortality in our study.

In our study there was 13% mortality. Among the ANC patients, mortality rate was 6.34% and among the PNC patients, mortality rate was 23.68%. Studies by Bibi S et al, Niyaz et al (13%) and Al - Suleiman SA et al (10%) too showed a similar mortality rate.^{6,7,13} Also, while Sriram S et al had nil mortality experience in their study,¹² Chawla S et al (28.5%) and Gupta M et al (23.7%) had higher mortality rates.^{4,8} Maternal mortality rate is significantly higher in developing countries (40%), compared to that in developed countries (0.1-3.4%) (Fapronle AF et al).¹⁴

Most common cause of mortality in the present study was Hepatic encephalopathy in 7 (53.84%) followed by Severe anaemia with sepsis in 4 (30.77%). Also a case each of Pyogenic meningitis with sepsis and Dengue fever with sepsis (7.7% each) had expired. Most of the expired patients were PNC and the average age of expired patients was 23.6 years (with lowest being 19 years and highest being 30 years).

In present study, none of the patients' qSOFA score was zero which is consistent with the requirement of admission in an ICU. Majority of the patients had qSOFA score of 1 (63%) followed by ≥ 2 (37%). 92.3% of the mortalities recorded had a qSOFA score ≥ 2 . This showed that a higher qSOFA score was directly linked to higher mortality ($P < 0.001$). In a study by Devabhaktuni Pet al, the SOFA score ($P < 0.001$) was statistically significant in predicting maternal outcome.⁵

Present study has a few limitations. Firstly, the

cross sectional nature of the present study was the main limitation which restricts the use of present study findings to large populations. Secondly, the sample size was small; a larger randomized clinical trial is required to strengthen the present study findings.

Conclusion

Based on the findings of present study we conclude that obstetric mortality was high in present study. Hepatic encephalopathy, severe anaemia with sepsis, Pyogenic meningitis with sepsis and Dengue fever with sepsis were the important causes of mortality. qSOFA score is an important tool in predicting mortality. Higher qSOFA score is directly linked to higher mortality. Availability of good obstetric care is the cornerstone to decreasing maternal mortality. Early assessment and intervention of critically ill obstetrical patients and the provision of separate ICU care for them, through a team approach involving Obstetricians and Anesthesiologists is ideal. All residents of Obstetrics and Gynecology should have short mandatory training phase in critical care.

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