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Study of Obstetric Emergency Cases Needing Intensive Care in a Peripheral Medical College

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ABSTRACT
It is important for ICUs to be prepared to manage critically ill obstetric patients. A team approach with an active involvement of the obstetrician is essential. Obstetric patients are generally young and fit, yet the potential for catastrophic complications is real. Regardless of the therapeutic advances of the last century, maternal morbidity and mortality continue to occur. To identify obstetric cases that arrive as emergencies needing critical care and the various interventions required, critical care management, importance of emergency critical care and its impact on future outcome of such admissions It was a prospective observational study this study was conducted from 1st May 2019- 30th April 2020 at the Department of Obstetrics and Gyanaecology and Intensive Care Unit, Midnapore Medical College. 40 patients were included in this study Majority of patients were admitted during 3rd trimester (50%) and after delivery (40%). No. of patients who died in this group was eventually high (3 each, 7.5%). Only 1 patient was admitted during 2nd trimester who survived well. 3 patients (7.5%) were admitted in 1st trimester with only one death (due to septicaemia resulting due to uterine perforation following D/E done outside). Only 7 deaths have occured in ICU among 38 maternal deaths during our study period. This fact shows that many mothers could have survived if they were shifted to ICU in proper time; which could not be done due to paucity of bed. This also shows the importance of providing intensive care to critically ill obstetric patients and the need for building up an ICU with sufficient beds in near future (devoted to only obstetric patients).

INTRODUCTION

The ability to handle critically sick obstetric patients is a must for intensive care units. It is crucial to have the obstetrician actively involved in a team approach[1]. Although most obstetric patients are in good health, serious problems can and do arise. Maternal morbidity and death persist despite the treatment advancements made in the last century[1,2].

Because of the unique medical conditions that affect pregnant women, the typical physiological changes that occur during puerperium and the necessity to care for both the mother and the foetus, intensive care unit (ICU) admissions of obstetric patients pose a challenge to intensivists. Ectopic pregnancies, septic abortions, haemorrhage, severe anaemia, ruptured uterus, eclampsia and severe preeclampsia are among the most prevalent reasons for obstetric patients to be admitted to an intensive care unit. Focusing on ventilatory methods, shock treatment and nutrition, this study aims to offer the latest principles in critical care management of obstetric patients[3].

Reproduction and its challenges have been documented since the beginning of time. The pains of childbirth can bring both joy and tears of sadness. In order to meet the needs of both the mother and the developing baby, the body's main systems undergo a temporary but irreversible modification during pregnancy. Yet, serious problems can develop throughout pregnancy, birth and the puerperium, complications during pregnancy leading to the need for admission to the intensive care unit [ICU]. About 117,000 maternal fatalities occur in India every year, according to UN agencies. This accounts for nearly 25% of all maternal fatalities globally[4]. In order to gauge the efficacy of maternity care, one looks at the maternal mortality rate (MMR). There is no country in the world where more women die during pregnancy than India. It wasn't until the 1960s that critical care as a concept and field got its start. When it came to intensive care units (ICUs), the first Consensus Conference was held in 1983 by the National Institute of Health and in 1988 by the Society for Critical Care Medicine, definitions and recommendations were set forth[5]. Every five minutes, a mother dies in India[6,7]. Recent results from the National Family Health Survey (NFHS- 3) indicate.

MATERIALS AND METHODS

It is up to the obstetric team to decide whether or not to admit patients to the intensive care unit. Patients with severe organ dysfunction, those requiring invasive or non-invasive ventilator treatment, those requiring hemodynamic monitoring and vasopressor support and all critically sick obstetric patients are admitted to the intensive care unit. When necessary, we seek advice from medical and surgical professionals[5].

Study Area: Department of Obstetrics and Gyanaecology and Intensive Care Unit, Midnapore Medical College.

Study Population: All patients admitted in Intensive Care Unit with complications following pregnancy and delivery.

Study Period: 1st May 2019-30th April 2020

Sample Size: The estimated sample size will be 40.

Sample Design: Prospective observational study.

Inclusion Criteria:

- Pregnant women irrespective of gestation period and/or within 42 days of delivery admitted with documented need for intensive care, monitoring and interventions
- Cases with obstetric emergencies in 1st and 2nd stage of labour such as malpresentations, malpositions, deep transverse arrest, obstructed labour antepartum haemorrhage, eclampsia, rupture uterus
- Cases with obstetric emergencies in 3rd stage of labour such as retained placenta, post partum haemorrhage, post partum collapse
- Obstetric emergency cases referred from peripheries

Exclusion Criteria:

- Pregnancies associated with medical complications such as infective diseases, diabetes etc.
- Pregnancies associated with surgical complications such as appendicitis, hernia, cholecystitis

RESULT

Forty individuals make up our study group. Twenty-nine (72.5% of the total) of these patients made it to the ward and were eventually discharged. For improved management, four of them (10%) were sent to a higher centre. Case distribution according to initial diagnosis and end outcome, nevertheless, 7 patients (17.5%) died while receiving treatment in the intensive care unit.

In our study group of 40 patients, obstetric haemorrhage (APH, PPH) accounted for 47.5% of their admissions to the intensive care unit, whereas hypertension diseases (eclampsia, severe preeclampsia) accounted for 42.5%. There was a 50% case fatality rate and 10% admissions for patients with sepsis.charting the incidence rate breakdown by prenatal screening (Table 2).

Table 1: Interventions in ICU

Parameters	Frequency
Ventillation	7
FFP transfusion	10
Whole blood / packed cell transfusion	30
Inotropic support	9
Haemodialysis	3
CT scan	8
Central venous catheter	3

Table 2: Association between Patient diagnosis related to outcome with group

	Group			
	Survived	Died	Referred	Total
Patient diagnosis related to outcome	29	7	4	n = 40
Hypertensive disorders of pregnancy	11	4	2	17 (42.5%)
Obstetrical haemorrhage	16	1	2	19 (47.5%)
Sepsis	2	2	0	4 (10%)

Table 3: Distribution with all parameter

Demographic data	Total = 40	Died = 7
Age		
≤20	12	2
21-25	16	2
26-30	8	2
31-35	3	1
>35	1	0
Parity		
G1	24	3
G2	11	3
G3+	5	1
Timing of admission		
1st trimester	3	1
2nd trimester	1	0
3rd trimester	20	3
Postpartum	16	3

Table 4: Distribution with all parameter

Parameters	Frequency
Showing distribution of cases according to Mode of delivery	
Emergency LSCS	13 (65%)
Elective LSCS	0 (0%)
Normal vaginal delivery	4(20%)
Vaginal delivery with forceps	2 (10%)
Assisted vaginal breech delivery	1 (5%)
Total	20
Surgical interventions in ICU patients	
Subtotal hysterectomy	8
Bilateral internal iliac artery ligation	6
Modified B-Lynch suture	2
Salpingectomy	2
Rectus sheath haematoma repair	1
Perinatal outcome of 3rd trimester pregnancy	
Live term	6 (30%)
IUD/Still birth	4 (20%)
Early neonatal death	3 (15%)
IUGR	3 (15%)
Preterm	4 (20%)
Total	20

out of 40 patients, 28 (or 70%) did not receive adequate prenatal care and 2 (or 5%) did not survive. There were only 12 unbooked patients (30%) and 5 of them (12.5%) passed away. There is a statistically significant relationship between these variables (p = 0.0175) (Table 3).

The age distribution of the 40 patients was as follows: 12 were under the age of 20, 16 were between the ages of 21 and 25, 8 were between the ages of 26 and 30 and the remaining 10% were above the age of 30 (Table 3).

The bulk of the 40 patients in our study were first-time mothers (60%), with 11 patients being second-time mothers (27.5%) and the remaining patients being multigravida (12.5%). Three people (7.5%), three people (7.5%) and one person (2.5%) died in each of these categories.

In the third trimester, 50% of patients were admitted and 40% were admitted following delivery. Ultimately, a large number of patients (three each, 7.5%) died in this group. During the second trimester, only one patient was admitted and managed to live. There was one death (caused by septicaemia arising from uterine perforation following D/E done outside) and three patients (7.5%) were admitted during the first trimester.

As previously stated, the table shows that 20 patients were admitted during the third trimester. In the end, they were delivered via these techniques. Emergency LSCS had been performed on 65% of these women for the benefit of the mother or the infant, or both. An elective LSCS was not available. Of these women, four (20%) gave birth naturally, two (10%) used forceps during a vaginal delivery and just one (5%) had a vaginal breech delivery with assistance (Table 4).

Among the 20 patients who had given birth, the perinatal outcome was extremely variable. Six of them (30%) gave birth to a healthy baby at the full term. Four infants (20%) were stillborn or died while still in the womb. The remaining individuals were admitted to NNW. Out of the total, 3 infants (15%) died shortly after birth, 3 (15%) experienced intrauterine growth restriction (IUGR) and 4 (20%) were delivered prematurely (before 37 weeks) (Table 4).

DISCUSSION

In the one year period from 1st May 2019-30th April 2020, 15,456 women delivered in our hospital, with 38 maternal deaths, giving a maternal mortality ratio of 2.46 /1000 deliveries. The total admissions in the obstetric ICU were 40 women (ICU utilization rate was 0.26 per 100 deliveries) with 33(82.5%) survivors [4 of them were referred and 7 (17.5%) non-survivors. The mean age of the patients was 23.40±4.90 years and the mean gestational age was 36.04±3.862 weeks.

Gupta *et al*.[8] in a In a comparable study conducted at R.N.T. Medical College in Udaipur, India, a higher fatality rate (n = 10, 41.67% of the patients) was shown. Moreover, the incidence of intensive care unit utilisation was 0.14 percent lower.

Demographic details of 40 patients according to maternal outcome are shown in Table 3.

Except for patients who had a proper prenatal visit compared to those who did not, no demographic data was identified as a risk factor for maternal death ($p<0.05$).

On the other hand, Gupta *et al*.[8] failed to discover any correlation between greater mortality and demographic profiles such as literacy, prenatal visits, mode of admission, background, etc.

Most of the mothers were admitted in the third trimester (50%) or after giving birth (n = 16, 40%), while a small percentage (10%) were treated due to early pregnancy haemorrhage.

Hypertensive disorders of pregnancy with respiratory and cerebrovascular consequences (n = 17, 42.5%) and hemodynamic instability (n = 19, 47.5%), were the most common and major primary indications for intensive care unit admission.

But 9 patients (22.5%) needed inotropic assistance (vasopressors) and 7 patients (17.5%) needed ventilatory support while they were being treated. 30 patients, or 75% of the total, were given either whole blood or PRBC (Table 1).

In their investigation, Gupta et al.[8] discovered that ventillatory support was stronger (70.83%) and inotropic (91.66%).

Four patients (57.14%) who needed a ventilator made it through the ordeal, while three (42.15%) did not.

The regulated ventilation duration for survivors was substantially longer at 41.14±28.54 hours compared to non-survivors at 20.56±22.25 hours (p = 0.01). The average length of ventilation was 30.17±21.65 hours (range 0.5-96 hours).

The average amount of time spent in the intensive care unit was 6.40±3.29 days, with survivors spending longer (6.82±3.09 days) than non-survivors (4.29±3.68, p = 0.0643).

It is now believed that between 0.1% and 0.9% of parturients have complications requiring ICU admission[9].

We discovered a pitiful intensive care unit use rate (n = 40, 0.26%) after analysing critically sick obstetric patients at our institution for a year. There may be a lack of intensive care unit beds and a delay in determining the criticality of certain patients, since the majority of deaths (n = 31/38, 81.58%) happened in the wards or the labour room without the use of intensive care unit services. Since our study group solely included patients hospitalised to the obstetric intensive care unit, we do not yet know the demographics of these patients or what factors contributed to their mortality. Utilisation of intensive care unit services is higher in industrialised nations (0.70)[10].

Although most obstetric patients are relatively young, research has shown that the gestational age of very sick parturients varies[11].

While studies conducted in industrialised nations often admitted term parturients for pre-eclampsia, ours found that the majority of these women were admitted for obstetric haemorrhage and hypertensive disorders of pregnancy accompanied by respiratory and cerebrovascular problems[11].

Obstetric problems and outcomes are significantly impacted by low socioeconomic level, lack of education and inadequate prenatal care[12].

While we were looking for a correlation between variables like literacy rate and rural/urban background and increased risk of intensive care unit admission or worse outcomes, we came up empty.

The lack of antenatal care has not been associated as a risk factor for ICU admissions[11]. But in our study it has been found that patient with proper antenatal care had higher survival rate (2 patient out of 28 died, p = 0.0175).

It has been reported by Okafor and Efetie[13], the leading causes of maternal intensive care unit admission include hypertensive diseases involving respiratory and cerebrovascular problems, as well as significant obstetric haemorrhage. Critically sick obstetric patients are at increased risk of multiple organ failure and death unless they are identified early and sent to tertiary hospitals with intensive care units where they can receive optimal treatment for circulation, blood pressure and breathing.

At the same time, in comparison with other authors[14], we found a similar percentage of pre-eclampsia and eclampsia (n = 17, 42.5%).

The majority of the authors have documented an increased rate of postpartum admissions to the obstetric intensive care unit (100%)[12], we find a lesser amount of postpartum admission (n = 16, 40%)

Postpartum hemodynamic alterations, including a 65% increase in cardiac output, rapid blood loss following delivery and a drop in plasma oncotic pressure, are likely to blame for the majority of postpartum admissions. For another, unless absolutely required, most people are reluctant to remove a pregnant lady from the expert care of an obstetrician.

Even though most cases of hemodynamic instability may be handled in the delivery room, the main reason to move to the prenatal ICU is when mechanical breathing is necessary. Since the services of obstetricians are no longer a priority after delivery, the criteria for transferring to the intensive care unit become more generic.

Our study found that ventilator support was a significant reason for admission to the intensive care unit (n = 7, 17.5%).

Of the patients in this study, 17.50% needed ventilatory assistance and 22.5% needed inotropic support. There was a strong correlation between mortality and both of these supports, however it was not statistically significant.

Quack medicine, low socioeconomic position, inadequate prenatal care, low haemoglobin levels and

malnutrition during pregnancy are all factors that contribute to higher maternal death rates in underdeveloped nations.

All of the aforementioned demographic variables were not associated with death rates in our analysis, with the exception of adequate prenatal care. Acute renal failure, septicaemia, pulmonary embolism, DIC and CVA were the top causes of maternal mortality and hospitalisation, as previously stated[11].

Patients who were admitted with obstetric haemorrhage (n = 4) in 3rd trimester had significantly better foetal survival (n = 3 (75%).

The routine application of scoring systems and risk estimation in critically sick obstetric patients is not feasible due to the small sample size of these patients compared to other populations.

Possible causes of the exaggerated risk include the reversibility of several obstetric disorders, such as preeclampsia and haemorrhage, with prompt and good treatment. Physiological rather than pathological changes during pregnancy provide the basis of several of the criteria utilised in these scoring systems. (for instance, MPM II, APACHE II and SAPS II results)

Given the limited sample size (n = 40), it was not possible to validate our conclusions; this was the primary drawback of our investigation, which was a single-center study.

We might have prevented a possible selection bias in our analysis by collecting demographic information and the reasons for death (n = 31, 81.58%) that happened outside of the intensive care unit (ICU) during the study period.

CONCLUSION

In spite of these caveats, it is possible to draw some cautious generalisations. We conclude that the most common reason for admission to the intensive care unit is obstetric haemorrhage, which can cause hemodynamic instability and hypertensive disorders of pregnancy. The primary therapies offered in the intensive care unit are inotropic support and ventilatory support. Those who made it out of the intensive care unit had longer ventilation times and hospital stays.

In intensive care units, accurate predictive scores have the potential to improve resource utilisation through aggressive treatment of patients with poor outcomes.

There has to be an ongoing quest for a better scoring system in severely ill obstetric patients, as our studies have attempted to predict mortality.

We hope that future multicenter investigations auditing obstetric intensive care units in India would lend credence to these findings. The education of resident physicians, consultants and nursing staff in the management of such patients would also be stimulated, leading to improved patient care. The critically ill obstetric patients in India could benefit from a more precise scoring system that would allow for better risk categorization in clinical trials and more precise monitoring of quality treatment.

There are just six intensive care beds in our medical school and hospital, which means that patients from every ward (surgery, medicine, G and O, etc.) must share the limited resources.

Out of 38 maternal deaths that occurred during our study period, only 7 occurred in the intensive care unit.

This proves that many mothers would still be alive today if they had been transferred to the intensive care unit sooner, which was not possible because of the bed shortage.

This further highlights the necessity for a dedicated obstetric intensive care unit with enough beds in the near future, as well as the need of providing critical care to seriously ill obstetric patients.

For developing nations like India, the long-standing issue of high maternal death rates can be alleviated, if only somewhat, by this.

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