

Critically Ill Obstetric Patients and Fetomaternal Outcome

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ABSTRACT

Reduction in the maternal mortality ratio (MMR) continues to be a worldwide challenge. With repeated analytical studies done over decades, it has become possible to identify the significant contributors to this challenge. Right from low socioeconomic status to the availability of recent technological advances, many factors need attention and prioritization. Obstetric hemorrhage remains an important cause followed by hypertensive disorders of pregnancy and sepsis. In this issue of IJCCM, Miglani et al. have highlighted the various levels of the delays, which are significant contributors to the high MMR. In other preventive strategies, efforts will be needed to improve patient education, infrastructure, availability of trained manpower, blood storage facilities, timely referrals, transport facilities, etc., at peripheral levels. In the tertiary care centers, there is an increased need for trained manpower in critical care, the obstetric medical emergency team as a new concept, aggressive teamwork in intensive care unit (ICU) and operation theaters, the use of advanced technologies and newer drugs, etc. It will remain a tough challenge to reduce global MMR to 70 per 100,000 live births, as per plans by the United Nations, by the year 2030.

Keywords: Fetomaternal outcome, Maternal mortality ratio, Obstetric critical care.

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OVERVIEW

The reduction in the maternal mortality ratio (MMR) has remained a worldwide challenge, especially in developing and underdeveloped countries. About 1,600 women die worldwide daily due to pregnancy-related complications.¹ In this issue of IJCCM, Miglani et al., in their prospective observational study, have tried to analyze the factors contributing to the unfavorable fetomaternal outcome in critically ill pregnant women. It is well known that, in this younger subset of patients, morbidity and mortality are highly preventable, provided we recognize the attributable factors. According to the NFHS-3 (National Family Health Survey of India, 2005–2006), the main reasons related to high MMR in India are:²

- Trained personnel not being available for deliveries.
- Poor awareness of antenatal care,
- Deficient postnatal care.

India stands second in the world in an absolute number of maternal deaths, though 1990 onward, there has been a significant decline, i.e., from 400 to 130 per 100,000 live births in 2016.³ Considering the magnitude of the problem, there have been aggressive attempts to minimize the MMR. Over the years, there have been remarkable advances in training the personnel as well as increasing the education level of the patients, but the challenge continues. In a recently carried out study by Horwood et al.³ on 1.9 million pregnant women from 9 empowered action group states in India, similar conclusions were drawn, besides specifically highlighting the timely availability of emergency care. The article by Miglani et al. in the current issue also highlights the different levels of delays and their impact on the fetomaternal outcome.

CLINICAL PROFILE OF THE CRITICALLY ILL PREGNANT WOMEN

Besides logistic and socioeconomic factors, a higher prevalence of systemic morbidity in parturients, in terms of peripartum hemorrhage, hypertensive disorders of the pregnancy, etc., seems to be causing a higher incidence of peripartum complications,

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compromising the fetomaternal outcome. This was highlighted in a recent study of more than 10,000 deliveries, by Tasneem and Sharma.⁴ They found that anemia prevailed in 25.5% of cases. Among 110 critically ill, out of 10,208 parturients, the main indications for intensive care unit (ICU) admission in their study were disseminated intravascular coagulation (DIC) (39%), eclampsia (22.7%), peri partum hemorrhage (PPH) (21.8%), hemolysis elevated liver enzymes and low platelets syndrome (HELLP) (13.6%), acute renal failure (10.1%), acute respiratory distress syndrome (ARDS) (3.6%), and sepsis (3.2%). Of these, 72.7% of patients needed ventilatory support, 60.1% needed inotropic support, 28.2% needed surgical interventions, and 10.9% needed dialysis. Of the critically ill pregnant women, maternal mortality was 12.8% and fetal mortality was 40.8%.⁴ In another recent study of 91 pregnant ICU patients (26 per 1,000, i.e., 2.6%) by Sailaja and Renuka,⁵ almost similar findings were noted. Being a tertiary care center, most patients were postpartum (84.6%) and referred to ones (63.8%). The major causes for the ICU admissions were hypertensive disorders (24.2%) and obstetric hemorrhage (23.1%). Mechanical ventilation was needed in 54.9%, blood transfusion in 46%, vasopressor therapy in 22%, and dialysis in 9.9% of patients. Mortality was 9.9% and sepsis was the cause in a third of the patients. The cesarean rate was about 47.3% and emergency laparotomy was needed in 14.3%.⁵

Over a decade, there seems to be a mild shift of etiology of the maternal morbidity and mortality from obstetric hemorrhage

being most common before and prevalence of the hypertensive pregnancy disorders to be on the rise in recent years. In 2011, Gupta et al.⁶ reported obstetric hemorrhage cases in obstetric ICU admissions to be 62.5% and hypertensive disorders of pregnancy as 16.6%. In one retrospective analytical study in 2014, Ashraf et al.⁷ reported obstetric hemorrhage as a cause of ICU admission in 51% cases and pregnancy-related hypertension in 11% cases. A few years later in 2018, Bahadur et al.⁸ reported obstetric hemorrhage cases in ICU to be 38.6% and those of hypertensive disorders of pregnancy to be 28.6%. In another recent analytical study of obstetric ICU admissions in 2019, Veerabhadrapa et al.⁹ reported proportions of obstetric hemorrhage and hypertensive disorders of pregnancy to be 30 and 33.3%, respectively. All these studies were from medical college hospitals, which essentially receive patients from lower socioeconomic strata.

BETTER FETOMATERNAL OUTCOME, PREVENTIVE STRATEGIES

Lower socioeconomic status, lack of education, and poor antenatal care, for a long time, are known to be associated factors for poor fetomaternal outcome.¹⁰ WHO statement once recorded that "there is a story behind every maternal death or life-threatening complications and understanding the lessons to be learnt can help to avoid such outcomes."¹¹ Thus to minimize the severity, one needs to go to the root cause of problems associated with poor fetomaternal outcomes. Multiple studies and reports have highlighted the root causes and hence the preventability, in case those are improved upon.¹²⁻¹⁶ Thus, it is essential that maternal and child healthcare programs are implemented effectively and priority is also given to the overall socioeconomic development of the community.¹⁶ Beyond this, improving the accessibility and comprehensiveness of the obstetric critical care in the peripheral areas where connectivity is a problem would go the long way in minimizing maternal and fetal mortality in our country. And it is also being emphasized that obstetric hemorrhage being still an important cause, bringing up blood storage facilities at peripheral centers would have a significant positive impact on reducing the MMR.⁷ Montgomery et al. also emphasized lack of facilities in rural areas and resultant high maternal mortality there.¹⁷ Poor transport facilities and referral delays have been very well known additional factors contributing to high maternal mortality.¹⁸ In this IJCCM issue, Miglani et al. have highlighted the different levels of delays including the pre- and intrahospital delays and their impact on fetomaternal outcomes. So, these delays have to be curtailed by multilevel efforts to educate all concerned and will include a big chain of people and agencies involved.

Once the patient reaches the tertiary care center, there may not be focused and special care for these critical obstetric patients and there is a concern raised for the special obstetric medical emergency team (O-MET).¹⁸ Most of the tertiary care hospitals have blood banks but necessary massive transfusion protocols may not be in place. Besides, hypothermia in massive blood transfusion is often neglected and needs priority and attention right from the beginning. Aggressive invasive hemodynamic monitoring will be essential to have precision in intravenous volume administration and vasopressor management. All the components of the triad of death, i.e., acidosis, hypothermia, and coagulopathy, need anticipation and timely intervention to evaluate and manage aggressively. The concept of obstetric ICU has been proposed long back but has not yet been accepted at most of the hospitals. As a

part of promoting the concept, we may need added efforts to train our obstetrician friends in critical care. Finally, managing critically ill obstetric patients is teamwork by an emergency intensivist, obstetrician, anesthesiologist, radiologist, and of course the nursing staff! Multiple shortfalls have been noted in the management of such a patient. Understanding the comprehensive meaning of shock status beyond a reading of low blood pressure (BP) is essential as it is a systemic disorder with a wider impact on multiple systems. With the rising prevalence of ICU admissions of hypertensive disorders of pregnancy patients, we need due attention to manage the special issues related to this. The timely decision of the cesarean section or the surgical intervention for obstetric hysterectomy in hemorrhage cannot be emphasized more. There have been delays in optimizing such patients and obtaining informed consent for the life-saving interventions. A senior team needs to be instrumental in executing these urgent tasks.

Multiple interventions, besides, endometritis and urinary tract infections do raise the possibility of severe sepsis which remains an important contributor to the high maternal mortality and preventive and therapeutic measures need good attention.

Recent advances like the availability of bedside ultrasound/ echocardiography, thromboelastography, advanced imaging, vascular interventions, and newer wide-spectrum antibiotics, etc., have shown a favorable impact on the fetomaternal outcome.

We will need comprehensive global efforts to reduce the global MMR to 70 per 100,000 live births by 2030, as planned by the United Nations in its expanded goal.¹⁹

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