



Obstetric risk factors requiring intensive care admission

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ABSTRACT

Management of high risk obstetric patients in critical care setting is challenged by altered physiology of pregnancy and concerns for the viability of the fetus. Pregnant patients, although young and healthy are at risk of developing thromboembolic complications, hemorrhage and infections. Obstetric hemorrhage, pre-eclampsia, cardiac diseases and sepsis are the main reasons for ICU admission in obstetric population. Delay in the diagnosis and correction of correctable conditions can ultimately require intensive care admission. There is a contrast in the overall incidence and prevalence of intensive care unit admission between developed and developing countries. Early clinical suspicion, timely referral and early institution of critical care of high risk patients may improve maternal outcome. Improvement of healthcare infrastructure and timely referral to tertiary care facilities may help reduce maternal mortality in developing countries.

Key words: Adult; Female; Hospital Mortality; Intensive Care Unit; Intensive Care Units/statistics & numerical data; Length of Stay/statistics & numerical data; Maternal Mortality; Pregnancy; Pregnancy Complications/mortality; Risk Factors

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INTRODUCTION

Management of critically ill obstetric patients is challenged by altered physiology of pregnancy and concerns for the viability of the fetus. Fortunately most of these patients are otherwise young and healthy and in majority of them pregnancy and labor progress without uneventfully. However, every pregnant patient is at risk of developing thromboembolic complications, hemorrhage and infections. Therefore, most women who ultimately require intensive care unit (ICU) admission have no prior risk factor, indicating towards a very important fact that the risk of serious maternal morbidity can be related to all pregnancies and not only for patients who are considered high risk.¹

This special article will focus on obstetric risk factors leading to ICU admission as these patients are challenging and unique cohort for healthcare providers.

Categorization of Critically Ill Obstetric Patients:

In ICU, pregnant patients may present with preexisting disease which gets aggravated during

pregnancy or acute diseases which may or may not be specific to pregnancy. Therefore, obstetric patients who are critically ill can be broadly divided into three groups:²

1. Patients with the preexisting medical conditions which are aggravated by pregnancy, e.g. chronic hypertension, valvular heart disease and diabetes mellitus.³
2. Patients with acute illnesses specific to the pregnancy, e.g. pre-eclampsia/eclampsia, peripartum hemorrhage and puerperal sepsis.
3. Parturient with new onset medical conditions, which are not as critical in a young adult without pregnancy, but are associated with significant mortality in pregnancy. For example, hepatitis E in pregnancy has a mortality rate of 20% as compared to 1% in non-pregnant women.⁴

Factors Leading to Intensive Care Admission in Obstetric Patients:

Common reasons for admission in ICU are 1) obstetric hemorrhage 2) hypertensive disorders and

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3) infections leading to sepsis.

Obstetrics hemorrhage can be antepartum like placenta previa and placental abruption or postpartum like uterine atony,^{5,6} and/or abnormal placentation.⁷ Hypertensive disorders leading to ICU admission are severe preeclampsia, eclampsia and HELLP syndrome.⁸ Infections leading to sepsis in obstetrics population are genital tract infection like chorioamnionitis, septic abortion, wound infection; renal causes like lower urinary tract infection; respiratory causes such as pneumonia, tuberculosis; and intraperitoneal causes either due to ruptured appendix or acute cholecystitis.⁹

Some parturient can have more than one complications. Anaesthesia-related severe morbidity as a sole factor leading to ICU admission is rare, which may reflect the trend of increased use of regional anaesthesia.¹⁰

Outcomes of Obstetric Patients Admitted to Intensive Care:

The outcome of obstetric patients admitted to the intensive care depends on their presenting illness, current status at time of admission and facilities available in ICU. Different investigators have reported outcome for women admitted to the intensive care unit. One study from Finland reported favorable outcome with only one maternal death.¹ Capuzzo et al. reported that after hospital discharge, most patients discharged from ICU returned to their pre-admission physical activity and social status.¹¹

Massive obstetric hemorrhage is still considered to be a major cause of maternal death and morbidity in both developing and developed countries.^{12,13}

One of the recent reviews from a large tertiary care hospital in Pakistan reveals that sepsis is the commonest cause of mortality, as out of 81 maternal deaths it accounted for 25% of death followed by hemorrhage (12%) and hypertension (7.5%), respectively.² In one study from Nigeria, the most common indication for ICU admission was ruptured uterus, and it represented 50% of the overall maternal mortality.¹⁴ In addition maternal un-booked status was an additional reason of maternal mortality in this study.¹⁴

Difference in ICU Admissions among Developed and Developing World:

There is an obvious contrast in the overall incidence and prevalence of ICU admissions between developed and developing countries. Critically ill obstetric patients account for as much as 7% of the ICU admissions in developing countries, while

they account for only 0.2%–0.9% in developed countries.^{15,16} The reason for small percentage of ICU admission in developed countries is perhaps an easy access to specialized centers for obstetric services, evidence-based practice, well-equipped labor rooms and financial support. The ratio of number of ICU beds per population is 2/100,000 in developing countries compared to 30.5/100,000 in the developed countries.^{17,18} This proportion is indicative of the standard of care provided to critically ill patients.

Reports from the developing countries have stated that 1.34% to 1.4% of obstetrics patients require ICU admission.^{2,19} Investigators have reported hemorrhage or hypertensive diseases of pregnancy as the main reason for ICU admission.²⁰⁻²² The additional factors for ICU admission in parturients from low- and middle-income countries include: infections, hepatitis, unsafe abortion and obstructed labor.²³ Many patients with hypertensive disorders are managed successfully under regional anaesthesia but uncontrolled fits in eclampsia is a reason for ICU admission in developing world.² Pulmonary edema secondary to severe preeclampsia is also one of the factors.² Sepsis leading to multi-organ failure, if antibiotics are not administered timely, still happens in the developing world.^{2,19}

Preventable Factors Influencing Maternal Outcomes:

A delay in the diagnosis and correction of correctable conditions like hypovolemia, defective coagulation, and ineffective surgical control of bleeding can ultimately require intensive care admission. These are avoidable factors and timely effective management can prevent ICU admission.

Pregnancy is a condition which can present with preventable morbidity even where there is optimum care and well-developed maternal services.²⁴ The main reasons for poor maternal outcome in underdeveloped areas are non-availability of skilled healthcare providers, proper pathways for antenatal, intrapartum and postnatal care and underutilization of healthcare facilities.²⁵ In addition high fertility rates, illiteracy and an ineffective referral system are the main factors leading to high maternal morbidity and mortality in developing countries including Pakistan.^{25,26}

An average of 89% (77.1% urban and 94.1% rural) of birth deliveries take place at home in Pakistan, where a traditional untrained birth attendants are the main healthcare providers.²⁶

Considering the high number of women who deliver at home or in basic health units in developing

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countries, there is a need for a regional referral center to respond to emergency situations. Skilled birth attendants and trained anesthesiologists can make a huge impact in improving maternal morbidity and mortality.

In developing countries, delayed presentation at health facilities influences outcome.²⁷ Strategies are needed for educating pregnant women and their families' about the importance of reaching a healthcare facility at the onset of symptoms which can lead to complications. Education on the signs and symptoms of impending complications and earlier referral can improve outcomes. The timely and appropriate medical attention can have a positive effect on patient's outcome.

A small proportion of these patients, after initial treatment and stabilization, may require an early referral to a tertiary care unit and ICU admission. An early referral to the IVU with optimal care of circulation, blood pressure and ventilation may reduce the occurrence of multi-organ failure in high risk patients. The primary and secondary care healthcare providers should be made aware to recognize these patients and refer them to tertiary care facilities having ICU care.²⁸

Improvement of healthcare infrastructure and timely referral to tertiary care facilities may help reduce maternal mortality in developing countries.²⁹ Addressing the need for accessibility and comprehensive obstetric care, especially in the less connected regions is a dire necessity for reducing

the maternal mortality. One critical area that needs improvement is adequately stocked blood banks in peripheral health centers. Cruz found an inverse association between donor blood availability and both maternal mortality ratios and risk of death due to postpartum hemorrhage.³⁰ In addition, dedicated obstetric units specialized for high risk obstetric patients can ensure that there is no delay in patient management and intensive care can be instituted at the earliest.

CONCLUSION AND RECOMMENDATIONS

In conclusion, the need for intensive care is unpredictable and unavoidable at many times. Obstetric hemorrhage, pre-eclampsia, cardiac diseases and sepsis are the main reasons for ICU admission in obstetric population. Patients presenting with such conditions are placed in a high-risk category. It is recommended to provide education to the patient and her family to seek timely medical consultation. The healthcare providers from primary and secondary level hospitals should be educated to recognize high risk parturients requiring ICU care. As early clinical suspicion, timely referral and early institution of critical care of high risk parturient may improve maternal outcome.

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