Management Principles of the Critically Ill Obstetric Patient

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KEYWORDS

- Critical illness • Pregnancy • Peripartum cardiomyopathy
- Cardiopulmonary resuscitation • Hypertensive crisis
- Massive transfusion protocol

The goals in management of critically ill obstetric patients involve intensive monitoring and physiologic support for patients with life-threatening but potentially reversible conditions. Management principles of the mother should also take the fetus and gestational age into consideration. The most common reasons for intensive care admissions (ICU) in the United States and United Kingdom are hypertensive disorders, sepsis, and hemorrhage. The critically ill obstetric patient poses several challenges to the clinicians involved in her care, because of the anatomic and physiologic changes that take place during pregnancy.

CRITICAL ILLNESS IN PREGNANCY

Prevalence

The estimated prevalence of obstetric patients requiring ICU admission is 0.9% both in the United States and the United Kingdom. Mortality of critically ill obstetric patients ranges from 12% to 20%.[1] The most common cause of maternal death in the ICU is acute respiratory distress syndrome (ARDS).[2]

Prognosis

Patients with primary obstetric disorders tend to have a better overall prognosis as delivery of the fetus usually reverses the illness and resuscitation is more effective. Preterm babies also have a chance of survival in hospitals with established neonatal intensive care units. Several retrospective studies have analyzed the racial differences with regard to ICU admissions and the outcome of parturients. Ethnic minorities, recent immigrants, and low socioeconomic status have been associated with poor outcome.[3] Obstetric patients admitted to the ICU have a better prognosis and mortality is lower than for general medical ICU patients. Nonobstetric critical illness in pregnant women significantly affects fetal and neonatal outcomes. Maternal shock, blood product transfusion, and lower gestational age are associated with an increased risk of fetal loss.[4]

The Confidential Enquiry into Maternal and Child Health in the United Kingdom made a few recommendations aimed at improving child health and reducing maternal mortality.[5] These recommendations highlighted the importance of early recognition and management of severely ill pregnant women, and routine use of early warning scoring systems to be used for obstetric patients.[6] Early recognition of critical illness is essential for a favorable outcome for mother and baby. Prognostic criteria such as APACHE scoring may not predict mortality as accurately in pregnancy as they do

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outside of pregnancy. One of the reasons for this difference is the physiologic changes of pregnancy such as an increase in heart rate, change in white cell count, or even a drop in normal values for creatinine that can affect the score. In many cases, delivery results in a drastic improvement in the disease course and a lower mortality, even when initial indicators suggest a high mortality.

Obstetric Versus Nonobstetric Disorders

Primary obstetric disorders account for 50% to 80% of ICU admissions during pregnancy and the puerperium in all parts of the world.[3,7] More than 80% of these admissions are because of preeclampsia and its complications, hemorrhage, and sepsis. Nonobstetric disorders in pregnancy show large geographic variations. In developed countries, asthma, pneumonia, drug abuse, complicated urinary infections, preexisting autoimmune disorders, chronic pulmonary disease, endocrine disorders, trauma, and pulmonary thromboembolism are common.[8,9] Medical disorders commonly seen in developing countries include severe malaria, viral hepatitis, cerebral venous sinus thrombosis, tetanus, tuberculosis, rheumatic valvular heart disease, and anemia.[7] Some of the common obstetric and nonobstetric causes are listed in **Box 1**.

ICUs in developed countries are increasingly challenged with a unique subgroup of pregnant women. Advances in health care have resulted in survival to child-bearing age of women with disorders such as surgically corrected complex congenital heart disease and organ transplant, and chronic disorders such as cystic fibrosis. Pregnant women with these conditions have increased morbidity and tend to require intensive medical care.[10,11]

Box 1
Causes for critical illness in pregnancy

Obstetric causes
- Obstetric hemorrhage
- Placental abruption
- Preeclamsia/eclampsia
- HELLP syndrome (HELLP is an abbreviation of the main findings: hemolytic anemia; elevated liver enzymes and low platelet count)
- Acute fatty liver of pregnancy
- Chorioamnionitis
- Amniotic fluid embolism
- Puerperal sepsis
- Pelvic septic thrombophlebitis
- Peripartum cardiomyopathy

Nonobstetric causes
- Respiratory failure
- ARDS
- Acute renal failure
- Urinary tract infection
- Diabetic ketoacidosis
- Drug abuse

MANAGEMENT PRINCIPLES OF A CRITICALLY ILL PARTURIENT

Some of the common indications for transfer of patients to the ICU are listed in **Table 1**. As in a nonpregnant critically ill patient, the initial assessment of a parturient is focused on airway, breathing, and circulation.

Airway

Airway evaluation and management remains the first priority as in a nonpregnant patient. Supplemental oxygen may be required in some patients depending on their oxygen saturation. Tracheal intubation is needed in the setting of persistent hypoxemia, airway obstruction, impaired laryngeal reflexes, or altered consciousness. Because pregnant women are at a high risk for aspiration of gastric contents, endotracheal intubation should be performed sooner rather than later to protect the airway. If the airway examination indicates that tracheal intubation is likely to be difficult, awake intubation should be performed with

Table 1
Causes of shock in obstetric patients

Hypovolemic shock	Hyperemesis gravidarum, ruptured ectopic pregnancy, placental abruption, placenta previa, postpartum hemorrhage, uterine rupture, trauma
Septic shock	Chorioamnionitis, puerperal sepsis, septic abortion, pneumonia, pyelonephritis
Cardiogenic shock	Valvular heart disease, peripartum cardiomyopathy, acute myocardial infarction, myocarditis