EDITORIAL VIEW

Perioperative invasive monitoring in obstetric emergencies

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ABSTRACT

The choice of monitoring in obstetric emergencies depends upon many factors, including the liking and the expertise of the anesthesiologist and the availability of the required disposables and equipment. But the main deciding factor remains the clinical condition of a particular obstetric patient and the judgment of the treating physician. This editorial throws some light on the varied aspects of invasive monitoring.

Key words: Obstetric; Uterine hemorrhage, Postpartum hemorrhage; Pre-eclampsia; Eclampsia; Monitoring, physiological

Citation: Zameer M. Perioperative invasive monitoring in obstetric emergencies. Anaesth Pain & Intensive Care 2014;18(4):327-328

Every minute of every day, a woman dies in pregnancy or childbirth. The biggest killers are obstetric hemorrhage and pre-eclampsia / eclampsia. The successful treatment of which is still an equally big challenge in both the developed as well as the developing worlds.

Antenatal or postpartum maternal hemorrhage can he masked until significant blood loss has occurred. Considerable time may be lost before the recognition of excessive blood loss, and physiologic deterioration can occur rapidly. A well-prepared plan of investigations and immediate response can significantly affect the outcome in a positive way.

Pre-eclampsia is a multisystem disease characterized by hypertension, proteinuria and generalized edema. The presence of systemic vasoconstriction, intravascular volume and protein depletion, organ dysfunction, coagulation abnormalities, edema of brain, larynx and lungs, make this disease of particular concern to obstetricians as well as the anesthesiologists.

Management of these parturients depends upon early recognition, assessment of resuscitative efforts and standardized noninvasive and invasive monitoring in high dependency or critical care units.

Whereas noninvasive measurement of blood pressure, heart rate, oxygen saturation, urinary output, and fetal cardiotocography is a standard practice in most of the labor and delivery facilities, the use of invasive monitors is variable and is not standardized. Despite practice guidelines written by a number of professional organizations, including the Joint Task Force of American College of Physician, the American College of Cardiology and the American Heart Association, poor collection and incorrect interpretation of hemodynamic data from invasive monitoring remain the key problems with their use.[1] In addition to correctly interpreting the data produced, knowing when to use 'invasive monitoring' is a vital clinical skill. The indications for invasive arterial blood pressure monitoring during obstetric emergencies include the desire to manage blood pressure more precisely, lack of reliable noninvasive cuff measurements, a need for vascular access for repeated blood studies, and planned use of certain hemodynamic agents (particularly drugs given by infusion e.g. nitroglycerin and nitroprusside etc). By contrast, the indications for invasive central monitoring, e.g. central venous pressure and pulmonary

arterial pressure (CVP & PAP) monitoring are not uniformly accepted. A CVP catheter is often placed to yield an approximation of volume status and to give a greater understanding of the mechanical phases of the cardiac cycle. Management of oliguria unresponsive to fluid challenge, pulmonary edema, and refractory hypertension are some clinical situations in which CVP monitoring is desirable.

A pulmonary artery (PA) catheter can assist in determining the etiology of pulmonary edema, oliguria with normal CVP or a cardiovascular failure. It provides useful information on left and right ventricular function, SVR and cardiac output. But its routine use is controversial.[2]

In deciding between PA vs CVP catheter the clinician should recognize that although the insertion related complications are similar, the PA catheter is associated with more use related complications e.g. balloon rupture, pulmonary infraction and erosion of pulmonary artery. The 2007 Practice Guidelines of American Society of Anesthesiologists Task Force on Obstetric Anesthesia state that "the decision to perform invasive hemodynamic monitoring should be individualized and based on clinical indications, including the patients' medical history and CVS risk factors." No controlled trials are available that may confirm the benefit of PA catheter monitoring on maternal or fetal outcome.[1]

Further modalities for hemodynamic monitoring, such as Doppler ultrasonography and three or even four dimensional echocardiography are able to provide detailed, dynamic information on cardiac structures and function and in the future may offer significant clinical advantages.[3,4]

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