ROLE OF ANESTHESIOLOGIST IN REDUCING MATERNAL MORTALITY RATE IN INDIA

Sandeep Sahu, Indu Lata*, R.P. Sharma*****, Suresh Chandra*****, D.S. Martolia***, S. Nigam****, Vijai Kumar Chaudhary****

Senior Resident*, Lecturer**, Asstt. Professor***, Associate Professor****, Professor*****

Deptt. of Anaesthesia and Community Medicine, G.S.V.M. Medical College, Kanpur, (U.P.)

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Summary

Maternal mortality continues to be high in India and other developing countries. A high maternal mortality rate not only reflects inadequacy of health services, but also a low standard of living and socioeconomic status. Poor antenatal care, deliveries by untrained birth attendants, unsafe abortions, inadequate services, late referrals, lack of skilled staff at the peripheral hospitals and social factors like poverty and illiteracy lead to various life threatening complications, necessitating intensive care. Only combined efforts of community medicine, good obstetric care and trained anesthesia and intensive care be helpful in reducing MMR.

Introduction :

With 16% of the world's population, India accounts for over 20% of the world's maternal deaths. The maternal mortality ratio, defined as the number of maternal deaths per 100,000 live births, MMR (Maternal Mortality Rate) in India is 407 per 100, 000 live births. (1998). In 2000,the United Nations estimated global maternal mortality at 529,000, of which less than 1% occurred in the developed world. However, most of these deaths have been medically preventable for decades, because treatments to avoid such deaths have been well known since the 19502s. According to the WHO, "A maternal death is defined as the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management but not from accidental or incidental causes."

Obstetrics as a speciality is unique in the every case, elective or emergent, involves an aspect of critical care. Anesthesiologists as critical care specialists play an important role in managing these challenging patients.

Obstetric haemorrhage :

This is the underlying causative factor in at least 25% of maternal deaths. A better understanding of causes and management of obstetric haemorrhage is a valuable guide to resuscitation.

Crystalloids administration, if massive, results in dilutional coagulppathy, which necessitates FFP transfusion. Usually an increase in coagulate factor levels of at least 10% will be needed for any significant change in coagulation status and as 1 unit of FFP increases most factors by 2.5%, atleast 4 uits of FFP will be required. The availability of blood and FFP is necessary where obstetric care is provided to

avoid mortality in a bleeding parturient.

Pre eclampsia :

It presents with the triad of Hypertension, Proteinuria and Peripheral edema. Eclampsia is the term that denotes one or more grand mal convulsions in a parturient with no previous neurological history. Anesthesiologist has to recognize which category of pre-eclamptic parturient he is dealing with. By the time the parient is transfetted form the casuality to the labour ward:

- The BP may reach normal levels
- The BP may remain refractory to conventional antihypertensives like Alphamethyl dopa or Nifedipine.
- The BP may fall and the patient may become hypotensive.

The anesthesiologist should manage hypertension save life both of mother and fetus by using appropriate modifiable technique of anaesthesia like epidural anaesthesia in mild to moderate cases and G.A. in severe cases with appropriate antihypertensive agents like labetalol and understand and identify the exact reason for the hypotension in these treated pre-eclamptic parturient and tailor the management accordingly.

Pulmonary edema in a parturinet:

Normally PE(Pulmonary Edema) occurs when LAP exceeds 15-18 mm Hg... In pre-eclampsia, the parturient is hypoproteinemic and plasma oncotic pressure is likely to be low and fluid escapes into the alveoli at a much lower LAP. The association of leaky pulmonary capillaries seen as part of the pathophysiology of pre-eclampsia adds on to the comples haemodynamic situation. All the anesthesiologists should be trained in identigying an elevated JVP. An elevated JVP should suggest a water-logged patient or a patient in CCF. If oliguria is superadded on this clinical scenario, one should be careful about fluid management.

In Spinal subarachnoid block (SAB) an oliguric, hypoproteinemic pre-eclamptic patient with leaky pulmonary capillaries can trigger pulmonary edema and cardiovascular collapse.

If general anesthesia is given. If the patient is showing tracheal tug, hyperactive neck muscles, predominantly abdominal respiration and falling oxygen saturation, after reversal at the end of surgery, the anesthesiologist must be mentally prepared to artificially ventilate the patient.

Conduct of epidural in parturient with cardio vascular disease :

In a cardiovascular disease patient who is well compensated (Not in tachyeardia), and if time permits, a titrated epidural under the cover of a minimal inotropic support can accomplish successful anesthesia.

Any fall in BP is treated by increasing the inotropic support to 5-7μg/Kg/min. The blood loss occurring during surgery is replaced as 1:1 colloid or 1:2 crystalloid. Patients with cardiac problems like multivalvular heart disease refractory to inotropes and diuretics. GA with elective post op ventilation is the technique of choice. Time factor is also important and if maternal or fetal factor does not allow time for SAB or EA, one should straight away resort to GA.

C.P.R. in partutient :

As critical care physicians, anesthesiologists are the best in resuscitation. Pregnant women pose a few unique problems in CPR. In cardiac arrest the compromise in

venous return and cardiac output by the gravid uterus limits the effectiveness of chest compressions.

To treat the critically ill pregnant patient: Place the patient in the left lateral position. Give 100% oxygen. Establish intracenous (IV) access and give a fluid bolus. Consider reversible causes of cardiac arrest and identify and preexisting medical conditions that may be complicating the resuscitation.

Airway :

Hormonal changes promote insufficiency of the gastroesophageal sphincter, increasing the risk of regurgitation. Apply continuous cricoid pressure during positive-pressure ventilation for any unconscious pregnant woman. Secure the airway early in resuscitation. Use an endotracheal tube 0.5 to 1 mm smaller in internal diameter because the airway may be narrowed from edema.

Breathing :

Pregnant patients can develop hypoxemia rapidly because they have decreased functional residual capacity and increased oxygen demand, so be prepared to support oxygenation and ventilation. Verify correct endotracheal tube placement using clinical assessment.

Circulation :

Perform chest compressions higher on the sternum, slightly above the center of the sternum. This will adjust for the elevation of the diaphragm and abdominal contents caused by the gravid uterus. Vasopressor agents such as epinephrine, vasopressin, and dopamine will decrease blood flow to the uterus. There are no alternatives however to us all indicated medications in recommended doses. The mother must be resuscitated or the changes of fetal resuscitation vanish.

Defibrillation :

Defibrillate using standard ACLS defibrillation doses. There is no evidence that shocks from a direct current defibrillator have adverse effects on the heart of the fetus.

Emergency hysterotomy for the pregnant woman in cardiac arrest :

The resuscitation team leader should consider the need for an emergency hysterotomy (cesarean delivery) protocol as soon as a pregnant woman develop cardiac arrest. The best survival rate for infants >24 to 25 weeks in gestation occurs when the delivery of the infant occurs no more than 5 minutes after the mother's hears stops beating. This typically requires that the provider begin the hysterotomy about 4 minutes after cardiac arrest. It may seem counterintuitive given that the key to salvage of a potentially viable infant is resuscitatin of the mother. But the mother cannot be resuseitated until venous return and aortic output are restored. Delivery of the baby empties the uterus, relieving both the venous obstruction and the aortic compression. The hysterotomy also allows access to the infant so that newborn resuscitation can begin.

Organisational aspect :

An anesthesiologist working in a district headquarters hospital with judicious clinical examination and with knowledge and understanding of basic pathophysiology of anaemia, toxemia etc complicating pregnancy, can administer safe anesthesia. Even a district Headquarters hospital anesthesiologist must be well trained in artificial ventilation because most of the pulmonary or renal complication are reversible after termination of pregnancy. By improving the anesthetic setup in a District HQ

hospital, tertiary centres will be able to concentrate on complicated cases rather than managing normal deliveries.

In developed countries, anesthesiologists are allowed to handle obstetric cases only after two years of anesthesia training. In the first two years, the basic problems in obstetric anesthesia are drilled into his mind through a proper teaching program and algorithms available for every imaginable clinical scenario. Hence, a proper training at the postgraduate level instead of associating obstetric anesthesia with a shot of SAB will go a long way in reducing MMR.

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