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Peripartum Cardiomyopathy - The Anaesthetic Challenges

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Introduction

Peripartum cardiomyopathy (PPCM) is a rare form of dilated cardiomyopathy with high morbidity and mortality. Perioperative management requires a multidisciplinary team consisting of cardiologist, obstetrician, anaesthesiologist and neonatologist. The management should focus on the wellbeing of the mother as well as the baby. Here we describe our experience with a case of patient with PPCM in acute heart failure for emergency lower segment caesarean section (LSCS).

Case report

A young lady, weighing 106 Kg with 35 weeks gestation was referred to our hospital with the complaints of progressively increasing dyspnea and desaturation and a diagnosis of pulmonary edema. She had a history of two normal vaginal deliveries. Her past medical history revealed nothing significant. On arrival in the emergency department, she had a heart rate of 146/min, respiratory rate of 30/min, blood pressure of 160/100 mm Hg with features of heart failure like elevated JVP and bilateral crepitations on lung auscultation. Electrocardiogram was normal other than for sinus tachycardia. Her echocardiogram showed a dilated left ventricle (LV) and severe LV systolic dysfunction with an ejection fraction (EF) of 20-25% and global LV hypokinesia. Her laboratory parameters were within normal limits. A provisional diagnosis of peripartum cardiomyopathy was made and patient was started on non-invasive ventilation, diuretics and nitroglycerine. She improved symptomatically, but as she developed uterine contractions she was posted for emergency LSCS.

The patient was haemodynamically stable and maintaining an oxygen saturation of 96% on nasal prongs and had minimal basal crepitations. After initiating standard monitors, an arterial and central line were placed under local and invasive blood pressure and central venous pressure was monitored. We planned a modified rapid sequence induction. Apneic insufflation through the nasal prongs was continued during the induction. Once sterile draping was completed, she was induced with Inj. Fentanyl, Inj. Etomidate and intubated with Inj. Succinylcholine. After confirming bilateral air entry surgeon proceeded with the surgery and delivered a healthy baby who cried immediately. She was maintained on a mixture of oxygen, air and isoflurane. Inj. Oxytocin 5 IU was given as a slow bolus and 20 IU was added to 500 mL normal saline and given slowly. Intraoperative analgesia was supplemented with further boluses of fentanyl and Inj. Paracetamol. She remained haemodynamically stable throughout

surgery. Postoperatively she was given bilateral transversus abdominis plane block and shifted to cardiac intensive care unit for postoperative ventilation. She was extubated the following day and discharged on 8th postoperative day.

Discussion

Peripartum cardiomyopathy (PPCM) has been defined by the Heart Failure Association of the European Society of Cardiology Working Group on PPCM as Heart failure secondary to left ventricular systolic dysfunction with a LVEF <45%, occurrence towards the end of pregnancy or in the months following delivery (mostly in the month following delivery) and no other identifiable cause of heart failure.[1]

The incidence of PPCM varies with region and races and the exact incidence in Indian population is unknown. The aetiology is unknown and pathophysiology is thought to be multifactorial involving angiogenic, metabolic, hormonal and oxidative stress factors. The risk factors most implicated are multiple gestation, older maternal age, Afro-American race and prolonged use of tocolytics. Pre-eclampsia and gestational hypertension are strongly associated with PPCM.[2] Majority of them present in the early postpartum period. The symptoms of PPCM are often confused with those of normal term pregnancy and may vary from dyspnoea on exertion to a picture of florid congestive heart failure. Efforts should be made to rule out other causes of heart failure, as PPCM is a diagnosis of exclusion. One important differential diagnosis of heart failure in term women is severe preeclampsia which is associated with diastolic dysfunction.

There is no specific pattern seen on electrocardiogram though repolarisation abnormalities are common. Echocardiogram will show the dilated LV and should be specifically used to rule out intracardiac thrombus. Magnetic resonance imaging can provide more accurate evaluation of structure and function. Levels of Brain Natriuretic peptide and N- Terminal pro- Brain Natriuretic peptide are significantly elevated in these patients.[1]

The management of these patients is similar to systolic heart failure due to other causes with care taken for the foetal wellbeing. Certain drugs like Angiotensin Receptor Blockers and Angiotensin Converting Enzyme Inhibitors must be avoided till delivery. β -blockers especially metoprolol is helpful. Studies have indicated that patients with PPCM are especially sensitive to toxic effects of β -adrenergic stimulation and should be avoided whenever possible. Norepinephrine is indicated to restore blood pressure. [2]

An increased incidence of thromboembolic events is seen due to hypercoagulable state of pregnancy, cardiac dilatation and dysfunction and anticoagulation is recommended in patients with ejection fraction less than 35%.[3] The outcome is variable ranging from full recovery to death. Congestive heart failure, arrhythmias and thromboembolic events being the most common causes of mortality. The ejection fraction at the time of presentation is the best predictor of the outcome and studies have shown that EF<30% is associated with poor prognosis.[4]

Anaesthesiologists may have various roles to play from treating the heart failure in the critical care unit, providing labor analgesia and anaesthetic management of operative delivery. Early labor analgesia will help prevent the sympathetic responses to labor. Vaginal delivery must be assisted. These patients have been managed with both general and regional anaesthetic techniques. Since our patient was just recovering from heart failure and had an EF of 20% we opted for general anaesthesia. The anaesthetic goals should be to maintain cardiac contractility and preload and to prevent increase in afterload. Avoid drugs which may cause sudden fall in systemic vascular resistance. Invasive monitoring is indicated including pulmonary artery catheter.[5-7] Oxytocin decreases SVR and should be given slowly as an infusion.[8] Volume

expansion after delivery can lead to acute heart failure and auto transfusion can be prevented by early cord clamping. In the postoperative period these patients need intensive care monitoring.

References

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