Case Report

An anaesthetic quandary: Caesarean section during cardiac failure in a case of peripartum cardiomyopathy complicated by preeclampsia

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Abstract

Anaesthetic management of cardiac disorders in pregnancy has always been complicated and challenging. A rare but extremely fatal entity, peripartum cardiomyopathy (PPCM) is a life-threatening disease affecting the parturient with mortality rates as high as 35–50%. Developing in late pregnancy or immediately after delivery, this unique disorder endangers not only the mother but the baby as well. We report here a case of a 28-year-old female parturient presenting at 37 weeks of gestation for caesarean delivery with recently diagnosed peripartum cardiomyopathy (ejection fraction of 28%) complicated by severe preeclampsia. She developed cardiac failure just before the induction of anaesthesia. She was successfully resuscitated, operated under general anaesthesia and shifted to the critical care unit for further management.

Keywords: Anaesthesia, congestive cardiac failure, peripartum cardiomyopathy, preeclampsia

Introduction

A rare idiopathic disease having an incidence of 1 in 4,000 in the obstetric population, presenting with signs and symptoms of heart failure, with significant morbidity and mortality (35–50%) goes by the moniker of "peripartum cardiomyopathy" (PPCM).[1-4] Whilst there has been a multitude of case reports enunciating anaesthetic challenges in this population, we present a case which was distinct for the concomitant presence of preeclampsia and florid heart failure on the operating room (OR) table.[5-7]

Case Presentation

A 28-year-old female was admitted to the labour room at 38 weeks of pregnancy with associated breathlessness for safe confinement. The present pregnancy was uneventful till 7 days before admission when she had an episode of respiratory distress along with high blood pressure requiring medical attention. On admission, her electrocardiogram (ECG) showed sinus tachycardia [Figure 1] and an echocardiogram demonstrated severe left ventricular systolic dysfunction, a left ventricular ejection fraction (LVEF) of 28%, global hypokinesia, moderate mitral regurgitation (MR), mild tricuspid regurgitation (TR), moderate pulmonary artery hypertension (PAH) and grade III diastolic dysfunction with dilated left atrium (LA) and left ventricle (LV). A diagnosis of peripartum cardiomyopathy was made and her clinical condition improved after she was started on digoxin, frusemide and labetalol along with oxygen supplementation. She was planned for an elective caesarean section as she had a history of a previous caesarean section along with severe preeclampsia (proteinuria 742.3 mg/dL) and breech presentation in a setting of peripartum cardiomyopathy.

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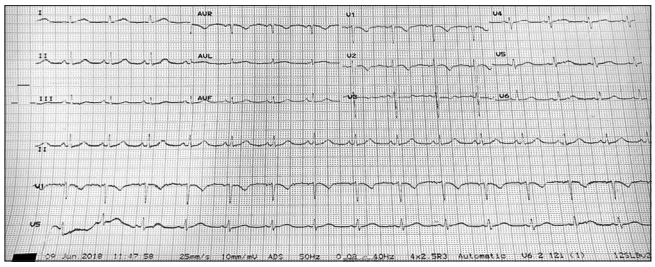

Figure 1: Electrocardiogram of the patient

Upon arrival in the OR, the patient had a baseline heart rate of 114 beats/min (regular) with a blood pressure of 178/108 mmHg, bilateral crackles in both lungs and a baseline SPO2 of 99% (on air) in supine position with a wedge under the right hip (to avoid caval compression). However, just before induction of anaesthesia, the patient became agitated, dyspnoeic, had decreased oxygen saturation despite oxygen supplementation and progressive increase in crackles in bilateral lung fields. This acute deterioration mandated an emergency tracheal intubation with intravenous (IV) etomidate 15 mg and succinylcholine 100 mg. A presumptive diagnosis of congestive cardiac failure was made and treatment in the form of IV morphine, frusemide (10 mg aliquots for a total of 40 mg) and a decision to proceed with caesarean section was made in consultation with the attending cardiologist and obstetrician. Intraoperative drug pharmacology consisted of morphine, isoflurane (0.6–0.8% in 100% oxygen) and atracurium (for neuromuscular blockade) as well as a slow infusion of oxytocin (10 units in 200 mL of normal saline) after the baby's delivery. The patient was ventilated with pressure-controlled ventilation (PCV). A healthy male baby (weight 2.5 kg) was delivered and was transferred to the neonatal care unit. The duration of surgery was 30 min and the haemodynamic parameters during and just after the procedure were acceptable. Her intraoperative urine output was 200 mL, estimated blood loss was 600 mL and had received 300 mL of intravenous fluid (lactated Ringer's solution) with no requirement of ionotropic support. The patient was shifted to the critical care unit (CCU) for elective ventilation and ionotropic support (dobutamine and noradrenaline infusion) which was gradually tapered off over the next 24 h and she was subsequently extubated with stable parameters. The rest of the hospital stay was uneventful for the patient as well as the baby and both were discharged home in a stable condition.

Discussion

PPCM is characterised as left ventricular ejection fraction (LVEF) ≤45% with or without LV cavity dilation occurring during the peripartum period. The history of previous heart disease and other heart failure causes goes against the diagnosis of PPCM.[1,2]

Amongst the plethora of symptoms that PPCM patients commonly present with, our patient had features like dyspnoea, orthopnea, systolic murmur and pedal oedema suggesting heart failure complicated by uncontrolled hypertension, while proteinuria was a reflection of concomitant severe preeclampsia.[8-10]

Similar to our patient, there is a significant rate of prevalence of preeclampsia (PE) in PPCM patients (more than four times the general population), which is attributed to common pathophysiological processes such as involvement of the vascular system and left ventricular dysfunction.[11-14] Patients with PPCM without PE have a better outcome than patients of PPCM with concomitant PE.[15-17]

A recent meta-analysis showed that general anaesthesia resulted in a better outcome in cases with borderline or low-systolic function (LVEF <30%) as compared to those with relatively better systolic function (LVEF 30–45%) where graded neuraxial blocks have been safely used.[18-20] We had also planned for general anaesthesia (GA) in view of a compromised cardiac condition (LVEF 28–30%) in the setting of severe preeclampsia. However, the episode of congestive cardiac failure on the OR table with imminent danger to the viability of the baby and risk to maternal life necessitated urgent intubation to ameliorate hypoxia of a severely compromised mother. The favourable hemodynamic profile of etomidate, restricted fluid therapy, slow infusion of oxytocin along with elective ventilation proved to be effective in maintaining cardiac stability during the perioperative period.

Thus, despite PPCM with PE being classically associated with poorer prognosis and our patient having an episode of heart failure on the OR table, a prompt and scientific multidisciplinary approach in our case helped us to beat the odds and we had a favourable obstetric outcome.

Primary care physicians have significant exposure to pregnant parturients and our case report highlights the need for a strong index of suspicion to rule out innocuous heart failure which surprisingly mimics physiological changes of pregnancy.

Take home message

- PPCM a is rare but significant entity complicating the terminal stages of pregnancy
- While planning anaesthesia for LSCS in these patients, important factors to be considered include the urgency of surgery as well as the prevalent associated complications
- In very rare circumstances, heart failure might be precipitated on the OR table during the perioperative course
- A multidisciplinary approach with the goal to avert radical swings in hemodynamic parameters, and avoidance of myocardial depression, whilst taking into consideration other complications of pregnancy is essential for a better outcome.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent with the clear understanding that the images and clinical details of the patient can be reported in the journal making due efforts to conceal their identity although their anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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