Case Report

Peripartum cardiomyopathy—An unsolved mystery to an anesthesiologist

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Abstract

Cardiac diseases in pregnancy pose a multitude of challenges to both anesthesiologists and obstetricians. Peripartum cardiomyopathy is one of the rare causes of dilated cardiomyopathy in parturients with a great diagnostic difficulty. High degree of suspicion along with good clinical experience is needed for its diagnosis. Unfortunately, mortality from this ranges from 35% to 50%. We report a case of 21-year-old female parturient presenting at 37 weeks of gestation for emergency cesarean delivery with undiagnosed peripartum cardiomyopathy. She developed cardiac arrest soon after giving spinal anesthesia. She was successfully resuscitated and shifted to ICU for further management. Bedside echocardiography was conducted, which showed dilated cardiomyopathy with an ejection fraction of 32%.

KEY WORDS: Undiagnosed peripartum cardiomyopathy, emergency cesarean delivery, cardiac arrest

Introduction

In 1971, Demakis and Rahimtoola[1] first defined peripartum cardiomyopathy as idiopathic heart failure (HF) occurring in the absence of any determinable heart disease in the last month of pregnancy or during the first 5 months postpartum.

Current diagnostic criteria for peripartum cardiomyopathy include the following[1,2]:

1. Development of HF in last month of pregnancy or 5 months postpartum
2. Absence of preexisting heart disease
3. Indeterminant cause
4. Echocardiographic findings (a, together with b or c; or all of these):
   a. Left ventricular end-diastolic dimension $>$ 2.7 cm/m^2
   b. M-mode fractional shortening $<$ 30%
   c. Left ventricular ejection fraction (LVEF) $<$ 0.45

Case report

A female parturient aged 21 years, second gravida, presented to us at 37 weeks of gestation. She was posted for emergency cesarean delivery. Preanesthetic evaluation was conducted in detail. Clinical history, examination, and investigations were within normal limits. She did not complain of breathlessness or increased fatigability at any time during her present pregnancy. She was not on any medications except for iron and calcium tablets. She underwent cesarean delivery 3 years back for cephalopelvic disproportion under subarachnoid block without any perioperative complications. Now she presented with leaking per vagina along with labor pains. Thus, she was posted for emergency cesarean delivery. On examination, her vital parameters were found to be normal. Systemic examination did not reveal any significant findings. Her routine laboratory investigations were within normal limits. A written informed consent was taken from the patient.

Anesthetic plan for this patient was subarachnoid block. On arrival to operation room, an 18-G IV cannula was placed on the dorsum of the left hand and 500 mL Ringer lactate infusion was started. Monitors were connected and baseline values of pulse rate, blood pressure, and saturation were noted. Preoperative ECG was within normal limits. Patient was made to lie down in the right lateral position and subarachnoid block was instituted in the L3–L4 interspace with 26-G spinal needle using 1.8 mL bupivacaine 0.5% (heavy) without any adjuvants. She was then turned to supine position immediately. Wedge was given under right hip to minimize aortocaval compression.

Immediately after turning to supine position, patient complained of breathlessness and difficulty in breathing. Her saturation began to fall and dropped down to 80%. Her blood pressure dropped down 80/40 mm Hg. Radial pulse was not felt. Within no time patient went in for cardiac arrest. Immediately, injection adrenaline (1 mg; 1:1000) and injection

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atropine (0.6 mg) were given intravenously (IV). She was intubated with cuffed endotracheal tube of size 7.5. Soon after, radial pulse was felt. Blood pressure shooted to 160/110 mm Hg. Obstetrician was asked to extract the baby as soon as possible. A live term female baby with good Apgar score was extracted. Uterus contracted well. Meanwhile, patient developed pulmonary edema. Pink frothy secretions started coming out of endotracheal tube. Pulse and blood pressure were maintained. Injection lasix (40 mg) was given IV. Second dose repeated after 20 min. But the patient's condition did not improve. The patient was shifted to ICU for further management. She was mechanically ventilated on assist control mode along with peep after paralyzing with injection vecuronium (4 mg) IV. Propped up position was given. Injection fentanyl (0.5 μg/kg/h) infusion was given in the ICU. A cardiology consultation was ordered. Bedside echocardiography was conducted, which showed global hypokinesia, left ventricular dysfunction with ejection fraction of 32%, and cardiomegaly. It was diagnosed as peripartum dilated cardiomyopathy.

The patient was treated for HF with digoxin, diuretics, vasodilators, and bromocriptine as per the orders of cardiologist. The patient's condition improved over a period of 10 days. She was successfully extubated on 11th day and shifted to ward. She was discharged on 15th postoperative day with an advice to continue the treatment. She was told to carry the discharge and treatment card to wherever she goes for the treatment of any other diseases.

Discussion

Peripartum cardiomyopathy is one of the rare causes of dilated cardiomyopathy presenting in the last trimester of pregnancy or within first 6 months after delivery in the absence of any preexisting cardiovascular disease. It presents with the symptoms of HF. Thus, HF therapy is advocated for this condition. Treatment goals include preload and after load reduction and increasing the contractility of the heart. Diuretics and nitroglycerine are used for preload reduction, digoxin as inotropic agent, and heparin prophylaxis for maintaining anticoagulation and to avoid the risk of thromboembolism. The prognosis is best when peripartum cardiomyopathy is diagnosed and treated early. Fortunately, despite a high risk of recurrence in subsequent pregnancies, many patients with peripartum cardiomyopathy recover within 3–6 months of disease onset.[3]

Newer drugs such as bromocriptine[4] and levosimendan[5] have been tried in the treatment of this condition but with limited success. Levosimendan reduces pulmonary capillary wedge pressure and improves cardiac output of patients with peripartum cardiomyopathy.

Very few case reports are available about the anesthetic techniques used in case of peripartum cardiomyopathy. Both regional anesthesia[6–10] and general anesthesia[11] have been used with limited success for patients previously diagnosed with peripartum cardiomyopathy.

Lata *et al*.[6] reported a case of previously diagnosed peripartum cardiomyopathy presenting for emergency cesarean delivery. She was already on drugs for the same. At the time of presentation, she had increasing fatigability and severe dyspnea on mild physical activity. 2D echocardiography showed left ventricular dysfunction with LVEF $<$ 25%. She was stabilized by giving lasix, digoxin, and diuretics. Lumbar epidural anesthesia was given for the patient with a combination of local anesthetic and fentanyl in titrated doses. The patient was successfully managed with no intraoperative and post-operative adverse events.

Tiwari *et al*.[7] reported a case series of five patients with peripartum cardiomyopathy who were successfully managed with novel approach of epidural volume extension technique.

Kumari *et al*.[9] have successfully used combined spinal and epidural technique for managing a patient of peripartum cardiomyopathy.

Soni *et al*.[11] have used general anesthesia successfully for patients with peripartum cardiomyopathy.

In our case, patient had cardiac arrest soon after giving spinal anesthesia because it precipitated sudden and rapid reduction of systemic vascular resistance and thereby preload. Similar case was reported by Bajwa *et al*.[12], wherein patient had cardiac arrest soon after starting of oxytocin infusion after extracting the baby.

Various such case reports[13,14] of cardiac arrest at induction of general anesthesia in parturients posted for emergency cesarean delivery with undiagnosed peripartum cardiomyopathy are available.

Conclusion

Diagnostic difficulty is of primary concern in this condition for us as anesthesiologists while evaluating such patients in case of emergency situations. High degree of suspicion is needed for the diagnosis of this condition and it is a diagnosis of exclusion. Most of the time, slight breathlessness and fatigability are confused with the labor pains and there will be no cardinal signs in cardiovascular system examination for the diagnosis of this condition.

Still the diagnosis of peripartum cardiomyopathy remains a mystery for anesthesiologists. If we are encountered with this type of situation, HF therapy should be instituted as soon as possible for better outcome. Definitive tests are yet to be discovered for the diagnosis of this condition.

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