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Case report

Anaesthetic management of a parturient with dilated cardiomyopathy: A case report



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Abstract Dilated cardiomyopathy (DCM) is a form of cardiomyopathy characterized by left ventricular or biventricular dilatation and impaired ventricular contractility. This results in systolic dysfunction of the heart with decreased left ventricular ejection fraction and progressive congestive cardiac failure. Pregnancy in patients with pre-existing dilated cardiomyopathy can flare up the disease and can be fatal. This case report describes the successful anaesthetic management of a parturient with dilated cardiomyopathy undergoing caesarean section under spinal anaesthesia.

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1. Introduction

Cardiomyopathy is a primary disorder of heart muscle that causes abnormal myocardial performance and is not the result of disease or dysfunction of other cardiac structure [1]. Dilated cardiomyopathy (DCM) is a form of cardiomyopathy characterized by left ventricular or biventricular dilatation and impaired ventricular contractility. This results in systolic dysfunction of the heart with decreased left ventricular ejection fraction and progressive congestive cardiac failure. There is an increased risk of malignant arrhythmias, thromboembolism and even sudden death [2]. Pregnancy in patients with pre-

existing DCM can flare up the disease and can be fatal. This case report describes the successful anaesthetic management

of a parturient with DCM undergoing caesarean section under spinal anaesthesia.

2. Case report

A 23 year old booked primigravida with 36 weeks gestation and a known case of idiopathic DCM with mild pre-eclampsia was scheduled for elective lower segment caesarean section (LSCS) in view of cardiac disease. Previous medical records revealed that patient was a diagnosed case of DCM since 6 yrs and her symptoms were well controlled with tab digoxin 0.25 mg od, tab furosemide 40 mg od and syp. Potchlor. Her past history did not reveal any viral infection, alcohol abuse or the use of β -adrenergic agonists.

On examination her pulse was regular with 96 beats per minute, blood pressure 140/90 mmHg and respiratory rate 22 per minute. Parasternal heave and systolic thrill were present. On chest auscultation ejection systolic murmur was heard, there were no ronchi or rales. She also had bilateral pitting pedal oedema.

Her laboratory investigations showed haemoglobin of 11.0 gm%, results of serum electrolytes, renal and liver func-

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tions were within normal values. ECG revealed Left bundle branch block. Echocardiography showed global hypokinesia of left ventricle, poor systolic function, ejection fraction of 36%, mitral regurgitation, aortic regurgitation and left ventricular end diastolic dilatation.

Elective LSCS of the patient was planned in view of cardiac disease and poor ejection fraction. A high risk informed and written consent was obtained. Regional (epidural) anaesthesia technique and the reason for its selection were explained to the patient and her co-operation requested. Two units of blood were made available for the surgery.

On arrival in the operating room intravenous access was established with an 18 G cannula and routine monitors (ECG, pulse oximeter and NIBP) were attached. On examination by the obstetrician, thick meconium stained liquor was found. Intrauterine resuscitative measures like oxygen inhalation and left uterine displacement was initiated. A request for quick induction made us change our plan and we decided to administer spinal anaesthesia with low dose of bupivacaine with fentanyl.

After taking all aseptic precautions, spinal anaesthesia was administered in sitting position with 1.2 ml of 0.5% (6 mg) bupivacaine and 25 µg fentanyl in L3–L4 interspace using 25 G quincke needle in a single atraumatic attempt. Patient was coloaded with 700 ml of lactated ringers solution. The patient was placed in supine position and a wedge inserted under the right hip to minimise aorto-caval compression. T6 sensory block was obtained after two minutes. Intravenous ephedrine 3 mg was administered after five minutes of spinal anaesthesia to correct hypotension (96/58 mmHg, appx. 30%). Surgery was commenced and a male infant weighting 2.5 kg was delivered after 10 min. Inj. oxytocin 2.5 IU bolus followed by infusion at rate of 10 IU/h was commenced after clamping of the umbilical cord. The APGAR score was 9 and 10 at 1 and 5 min, respectively. The patient was haemodynamically stable throughout the surgery. Patient received a total of 1000 ml of crystalloid and urine output was 100 ml intraoperatively. Total duration of surgery was 50 min. Postoperative analgesia was obtained with diclofenac transdermal patch 200 mg for next 48 h. Cardiologist advised her tab Enalapril 5 mg od, tab aspirin 150 mg od, tab carvedilol 3.125 mg bd and tab alprazolam 0.25 mg after surgery. Postoperative course of the patient was uneventful and she was discharged on tenth day.

3. Discussion

Dilated cardiomyopathy is characterised by left ventricular or biventricular dilatation and impaired ventricular contractility which results in progressive congestive cardiac failure. Most patients are first seen between the age of 20 and 50 years, but it may affect children and the elderly. The commonest aetiology is idiopathic or viral infections in children and alcohol abuse in adults. Most of the patients are asymptomatic with cardiomegaly and minimal cardiovascular symptoms and present later in the course with cardiac failure, when the mortality rate is high. The predictors of poor prognosis are an ejection fraction of less than 0.25 (as seen on Echo, during the acute presentation of heart failure), left ventricular end diastolic dilatation, a hypokinetic left ventricle, the presence of mitral and tricuspid regurgitation [1]. Physiological changes during pregnancy is characterised by an increase in cardiac output, a

reduction in systemic vascular resistance and a modest decline in blood pressure. The additional stress of increasing cardiac output in parturients with DCM results in decompensated ventricular failure. Symptoms include dyspnoea, orthopnoea, cough, swollen legs and chest pain. However in our patient, symptoms were well controlled with digoxin and furosemide.

Anaesthetic management for caesarean section in parturient with DCM is a challenging task. Both general and regional anaesthesia have been used. The goals of anaesthetic management are avoidance of myocardial depression, maintaining normovolemia, avoiding overdose of drugs during induction as the circulation time is slow and to avoid sudden hypotension when regional anaesthesia is the choice [3].

Major centro-neuraxial blockade may actually improve myocardial performance by reducing the after load on the left ventricle without improving contractility which may be beneficial in a situation of poor ventricular function, where no out-flow tract obstruction is present [4]. Epidural anaesthesia can safely and effectively be used with carefully titrated dose of local anaesthetics, and hemodynamic monitoring in parturient with DCM [5]. The changes in preload and after load produced by epidural anaesthesia mimic the pharmacological goals [3]. It is particularly advantageous in those patients with high susceptibility to aspiration of gastric contents.

We also had planned epidural anaesthesia in our patient but a request made by obstetrician for quick induction in view of foetal distress associated with thick meconium stained liquor made us change our plan to spinal anaesthesia. We did not consider general anaesthesia as the responses of sedative drugs or induction agents may be slow due to the slow circulation time which may usually be interpreted as a need for additional drug in a healthy patient [6]. Opioids with benzodiazepines or nitrous oxide cause severe cardiovascular depression. Use of high doses of opioids may necessitate postoperative ventilation for both mother and infant. Carefully administered regional anaesthesia avoids the stress of general anaesthesia.

There are reported cases in literature which describe the deleterious effects of general anaesthesia on cardiovascular and respiratory systems of both mother and the newborn. Carroll et al. used remifentanyl in a patient with peripartum cardiomyopathy (PPCM) and the newborn required naloxone to reverse the respiratory depression [7]. Mc Indoe et al. described a previously asymptomatic parturient with PPCM who presented with a cardiac arrest at induction of general anaesthesia for emergency caesarean section [8]. Similarly Wake et al. reported cardiac arrest immediately after the start of surgical procedure during emergency caesarean section under general anaesthesia in a patient with PPCM [9].

Low dose of local anaesthetic in addition to opioids minimises the haemodynamic instability associated with spinal anaesthesia. Although anaesthetists are apprehensive, but there are case reports where low dose spinal block has been successful and can be tried [10]. As the anticipated duration of caesarean section is less, these cases can be managed with low dose spinal block without any complications as there is no need to prolong the duration of block.

Although our patient had DCM but because of appropriate medical treatment she was asymptomatic preoperatively and was managed successfully with spinal anaesthesia. Such patients of cardiomyopathy with no features of congestive cardiac failure can be managed successfully with low dose of local

anaesthetic with opioid. Our case report highlights the same and signifies the importance of spinal anaesthesia in such patients.

Conflict of interest

None.

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