



ANAESTHETIC MANAGEMENT IN A PARTURIENT WITH VENTRICULAR SEPTAL DEFECT AND MODERATE PULMONARY ARTERIAL HYPERTENSION UNDERGOING EMERGENCY CAESAREAN SECTION: A CASE REPORT

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ABSTRACT

Background: The management of parturient with congenital heart disease (CHD), particularly those with ventricular septal defect (VSD) and pulmonary arterial hypertension (PAH), presents a significant anaesthetic challenge. Physiological changes during pregnancy, such as increased blood volume and cardiac output, exacerbate the underlying cardiac condition. The use of general anaesthesia in such patients has traditionally been favoured due to perceived safety; however, emerging literature supports the cautious use of regional techniques like combined spinal-epidural (CSE) anaesthesia. **Case Presentation:** We present the case of a 23-year-old primigravida at 36+5 weeks' gestation with a known history of sub aortic VSD and moderate PAH, who required emergency lower segment caesarean section (LSCS) due to active labour. Clinical and echocardiographic evaluations confirmed a left-to-right shunt, moderate tricuspid regurgitation, and preserved ejection fraction. The patient underwent successful delivery under low-dose spinal anaesthesia followed by graded epidural top-ups. Throughout the perioperative period, meticulous haemodynamic monitoring was maintained, and no adverse events occurred. **Conclusion:** With proper planning, close monitoring, and a multidisciplinary approach, regional anaesthesia, particularly low-dose CSE, can be safely administered in selected patients with CHD and PAH undergoing caesarean section.

KEYWORDS :

INTRODUCTION

Pregnancy in women with congenital heart disease is associated with increased morbidity and mortality, particularly in those with significant structural anomalies such as ventricular septal defect (VSD) and pulmonary arterial hypertension (PAH). These conditions challenge anaesthesiologists during surgical interventions, especially in obstetric emergencies. The physiological changes of pregnancy, including increased intravascular volume, heart rate, and cardiac output, can stress an already compromised cardiopulmonary system. VSD with a left-to-right shunt may lead to pulmonary overcirculation and worsening of PAH, potentially resulting in right ventricular failure.

Traditionally, general anaesthesia has been considered the safer option in such high-risk parturient, owing to the potential hypotensive effects of neuraxial techniques. However, evidence now suggests that regional anaesthesia, particularly using a low-dose spinal component with controlled epidural supplementation, may be safely implemented with reduced haemodynamic fluctuations and improved maternal satisfaction.

Case Presentation

A 23-year-old primigravida, weighing 50 kg, presented at 36 weeks and 5 days of gestation in active labour. She had a known history of congenital heart disease since childhood but was not on regular medication. Her effort tolerance was fair, capable of climbing two to three flights of stairs without symptoms. On clinical examination, her pulse rate was 110/min, blood pressure 130/69 mmHg, and oxygen saturation was 99% on room air. Cardiovascular examination revealed a pansystolic murmur and parasternal heave, while neurological and respiratory examinations were unremarkable.

Laboratory investigations showed haemoglobin of 12.6 gm% and platelet count of 1.95 lakh/mm³. Electrocardiogram showed no significant abnormalities. Transthoracic echocardiography revealed a subaortic VSD with left-to-right shunting and a peak interventricular gradient of 88 mmHg, moderate tricuspid regurgitation, moderate pulmonary arterial hypertension, mild dilation of the left atrium and left ventricle, and a left ventricular ejection fraction of 56%.

The patient was posted for emergency LSCS. As she was not nil per os, she was premedicated with intravenous ondansetron 4 mg and metoclopramide 10 mg. Antibiotic prophylaxis was administered, and standard multiparameter monitoring was established. A combined spinal-epidural (CSE) anaesthetic technique was chosen. Under aseptic precautions, an epidural catheter was placed at the L2-L3 interspace. A subarachnoid block was administered using 0.6 ml of 0.5% hyperbaric bupivacaine combined with 25 mcg of fentanyl. Sensory block up to the L1 dermatome was achieved, following which graded epidural top-ups were given to extend the block gradually to an adequate surgical level.

Intraoperative management included vigilant haemodynamic monitoring and fluid management to maintain euvoemia. Intravenous paracetamol 1 gram was given for analgesia. After delivery of the neonate, 15 IU of oxytocin was added to the intravenous infusion. The intraoperative course was uneventful, and the patient was shifted to a high-dependency unit for postoperative monitoring. Postoperative recovery was smooth with no adverse cardiac or obstetric events.

DISCUSSION

The anaesthetic management of patients with VSD and PAH undergoing caesarean section requires a thorough understanding of cardiovascular physiology and the pathophysiological changes of pregnancy. The major goals include maintaining stable systemic and pulmonary vascular resistance, avoiding abrupt haemodynamic changes, ensuring adequate oxygenation, and preventing right heart failure.

General anaesthesia, while effective, poses risks such as increased pulmonary vascular resistance due to positive pressure ventilation and sympathetic stimulation during intubation. Neuraxial anaesthesia, particularly high-dose spinal anaesthesia, may lead to sudden drops in systemic vascular resistance and subsequent cardiovascular collapse. To mitigate these risks, a low-dose spinal component with incremental epidural top-ups is a preferred strategy, allowing controlled haemodynamic changes.

This approach is supported by existing literature. Gehlot et al. demonstrated the efficacy of low-dose CSE in a patient with Eisenmenger syndrome undergoing caesarean section [1]. Similarly, Yamada et al. described the safe use of neuraxial anaesthesia in patients with severe PAH undergoing non-obstetric abdominal surgery [2]. Saline rather than air was used to identify the epidural space to reduce the risk of air embolism, a known hazard in patients with cardiac shunts.

CONCLUSION

With meticulous preoperative assessment, judicious choice of anaesthetic technique, and continuous intraoperative monitoring, parturients with VSD and moderate PAH can undergo safe delivery under regional anaesthesia. Combined spinal-epidural anaesthesia using a low-dose spinal block followed by graded epidural supplementation offers a favourable alternative to general anaesthesia in carefully selected patients.

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