CASE REPORT

Safety of epidural labor analgesia in a parturient with Ebstein's anomaly

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Abstract

The rare congenital heart defect of Ebstein's anomaly is characterized by downward displacement and elongation of the tricuspid valve with poorly contractile right ventricle, an enlarged right atrium along with tricuspid regurgitation. Supra ventricular and ventricular arrythmias are common. Here we describe the successful management of a pregnant patient with Ebstein's anomaly undergoing labour with epidural analgesia. Both the mother and newborn were discharged without any untoward problem.

Keywords: Ebstein's anomaly, Vaginal Delivery, Epidural Analgesia

Introduction

Ebstein's anomaly is a rare congenital heart defect that primarily affects the tricuspid valve, leading to significant tricuspid regurgitation, an enlarged right atrium, and a reduced right ventricular cavity [1, 2]. The severity of this condition varies based on the degree of valvular abnormality, right ventricular dysfunction, the presence of intracardiac shunts such as a patent foramen ovale, atrial septal defects and associated complications like pulmonary hypertension and cardiac dysrhythmias [1, 3, 4]. In many cases, patients can be asymptomatic, but in severe forms, the condition may present as congestive cardiac failure and arrhythmias. Managing labor and delivery in a patient with Ebstein's anomaly poses unique anaesthetic and cardiovascular challenges, making epidural labor analgesia a topic of interest in such cases.

Case Report

A 21-year-old primigravida with 37 weeks of gestation was admitted in labor for safe confinement. Patient was referred to a cardiologist earlier in pregnancy for a pansystolic murmur, incidental finding during her antenatal visit. Her 2D echocardiography revealed apical displacement of the tricuspid valve by 32 mm with Celermajer score: 0.75 (Grade II), presence of severe tricuspid regurgitation, dilated and atrialised right ventricle (18 cm^2) with normal function, ejection fraction 60% and no evidence of pulmonary hypertension.

Electrocardiogram showed presence of premature ventricular ectopics. Her vital parameters were, heart rate -98 bpm, blood pressure - 110/74 mmHg, oxygen saturation - 98% on room air, No signs of pallor, clubbing, cyanosis, or pedal oedema. Cardiovascular examination revealed a pansystolic murmur in the tricuspid area with right parasternal radiation. Patient's hematological and biochemical investigations were unremarkable. High risk consent was obtained in view of congestive cardiac failure and arrhythmia. All resuscitative drugs, equipment and defibrillator were kept ready. Infective endocarditis prophylaxis was given with intravenous ceftriaxone (1 g). Acid aspiration prophylaxis was given with intravenous ondansetron (6 mg) and metoclopramide (10 mg). Standard American Society of Anaesthesiologists (ASA)

monitors were used like, electrocardiography, pulse oximetry, non-invasive blood pressure, temperature, blood loss assessment and urine output. Ringer lactate was started at 60 ml/hr and intermittent oral clear liquids were allowed during delivery. Epidural catheter was inserted at L3-4 level with the help of 18 G epidural needle via median approach under strict asepsis.

Epidural space was located at depth of 4 cm and fixed at 8 cm at skin. Standard test dose (3 cc of lignocaine with adrenaline) was given to confirm correct catheter placement. Initial epidural bolus was given with 5 ml of 0.0625% bupivacaine and fentanyl 25 mcg. Patient's Numeric Rating Scale (NRS) score for pain was reduced to 2/10. Further boluses of local anaesthetic drugs were given as per patients demands, based on appearance of pain. Intermittent and diluted concentration of bupivacaine were given for labor analgesia. Total six dosages of 8 cc of 0.0625% bupivacaine with 10 mcg fentanyl were given at 45 minutes to 1 hourly interval. Left uterine displacement and oxygen supplementation were maintained throughout delivery.

Continuous maternal and fetal monitoring was ensured and was unremarkable. Second stage of labor was cut short by using ventouse. Intravenous carbitocin 100 mg and furosemide 20 mg were given slowly after the delivery of the baby. The epidural catheter was removed post-delivery.

Discussion

Ebstein's anomaly results in inadequate coaptation of the tricuspid valve, leading to tricuspid regurgitation and right atrial enlargement and elevated pressures [5]. Apical displacement of dysplastic tricuspid valve further reduces the right ventricular cavity size and hence the filling capacity of same. In patients with atrial septal defect or patent foramen ovale, increase in right atrial pressure increases shunting of blood from the right to the left side of the heart. This abnormal shunting can exacerbate hypoxia and hemodynamic instability, particularly under physiological stressors such as pregnancy and labor [6, 7]. Pregnancy significantly increases blood volume and cardiac output, which can worsen tricuspid regurgitation and elevate right atrial pressure [8].

The added stress of labor further increases sympathetic stimulation and catecholamine release, which can lead to arrhythmias, maternal hypoxemia, and congestive cardiac failure. Due to these factors, careful cardiovascular monitoring and adequate analgesia during labor is crucial. Vaginal delivery is preferred over caesarean section due to above mentioned risks. Epidural labor analgesia was found to be both safe and effective for this patient as slow administration of diluted concentrations of local anaesthetics helped in prevention of sudden precipitous hypotension and also avoidance of fluid boluses to correct hypotension. It also reduces the catecholamine levels during labor thus decreasing the risk of cardiac decompensation and arrythmia by preventing sympathetic stimulation [8, 9]. Another advantage of this technique is that it can be used for surgical anaesthesia too if required during the course.

Conclusion

The successful management of labor in a patient with Ebstein's anomaly requires multidisciplinary approach involving obstetrician, anaesthetist and cardiologist. Institutional delivery with risk stratification and careful planning is vital. Vaginal delivery remains the preferred mode, and epidural labor analgesia has proven to be a safe and effective

method for pain relief in such high-risk pregnancies. This case highlights the importance of individualized anaesthetic management to optimize maternal and fetal outcomes.

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