



Perioperative Management of Pregnancy in Rheumatic Heart Disease with Low Dose Spinal and Epidural Volume Extension

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Type of Publication: Case Report

Conflicts of Interest: Nil

Abstract

In a developing country, cardiac disease may complicate 5.9% of pregnancies with high maternal death. Early diagnosis, appropriate management prior to pregnancy, and good functional status at the time of entering pregnancy allowed for a good maternal and neonatal outcome in Rheumatic heart disease. Epidural volume extension helps in reducing the requirement of local anaesthetic required and also the incidence of hypotension, thus can be used in cardiac cases where in the level of spinal anaesthesia can be slowly increased.

Here, we present a primigravida with a known case of rheumatic heart disease who was operated for LSCS under Low dose spinal with EVE.

Keywords: Mitral stenosis, caesarean section, low dose-spinal-epidural anaesthesia, epidural volume extension (EVE), NIV

INTRODUCTION

Heart diseases are a significant cause of non-obstetrical maternal and foetal mortality in pregnant patients. If diagnosed and managed promptly, it can prove to be lifesaving for the mother and foetus. (1) In a developing country, cardiac disease may complicate 5.9% of pregnancies with high maternal death in which 6.8% belong to NYHA class III-IV. Due to risks to both the mother and foetus, neuraxial anaesthesia - spinal, epidural, or combined spinal-epidural (CSE) - is preferred over general anaesthesia for all obstetrical procedures. (2) Injecting local anaesthetic or saline into the epidural space after intrathecal injection with the intention of extending the block height has been widely investigated and has been termed epidural volume extension (EVE). (3) This reduces the dose of local anaesthetic and occurrence of hypotension.

Here we discuss the successful management of primigravida with known rheumatic heart disease (RHD) and pre-eclampsia who presented with

breathlessness, raised BP and low saturation on room air.

CASE REPORT:

22-year-old primigravida with 9 months of amenorrhoea came to the hospital with the complaints of breathlessness for 2 days. k/c/o rheumatic heart disease since 1 year and was on inj. Benzathine penicillin which was discontinued post conception. She was known case of pre-eclampsia since 1 month and was on T. lacilactone 50mg OD. There was no H/O fever, cough, cold, headache, blurring of vision, epigastric pain

PREOPERATIVE ASSESSMENT:

Patient was conscious, oriented to time, place and person. Afebrile, bilateral pedal oedema was present. Her pulse rate was 116/min, BP- 160/100mm of Hg, SpO2- Room air saturation was 88% & 94% with 10L/min O2. Respiratory rate- 21/min, RS- bilateral air entry equal with minimal basal crepts +, CVS-

S1S2 +, ejection systolic murmur +. Complete blood count, renal function tests, random blood sugars, ECG, serum electrolytes, coagulation profile was all within normal limit. 2D ECHO- EF-55%, RHD with mild mitral stenosis,

severe MR, Grade 2 AR, Grade 1 TR, Mild PAH. On airway examination- MPC 2 with no loose tooth. Sterno mental and thyromental distances were 12.5cm and 7cm respectively. Inj. Furosemide 20mg was given preoperatively.

POSTOPERATIVE CARE:

Patient was shifted to ICU oxygen supplementation of 2 lit/min with ventimask to maintain saturation of 98-100%. One hour after shifting she was taken on NIV in view of respiratory distress with saturation of 90%, she was put on furosemide infusion, strict fluid input and output monitoring was done and she responded to the treatment. Epidural top up with Inj. bupivacaine 0.125% 8cc was given every 8 hourly. Patient was followed up with ABG, Chest x-ray, serum electrolytes daily. She was gradually weaned from NIV and was taken on oxygen mask @ 4L/min, Post-operative period was uneventful. Mother and baby were discharged on 10th post operative day.

DISCUSSION:

RHD continues to be a major cause of cardiac disease complicating pregnancy. However, early diagnosis along with appropriate management prior to pregnancy, and good functional status at the time of pregnancy allowed for a good maternal and neonatal outcome. (1) Women with moderate to severe mitral stenosis do not tolerate the hypervolemic and hyperdynamic cardiovascular alterations which is associated with pregnancy, labor and delivery. The anesthetic management of these patients is challenging and remains somewhat controversial. (2)

A gradually titrated lumbar epidural analgesia or CSEA, in consideration to optimize preload, afterload, heart rate, and rhythm, can be used for analgesia and anesthesia in nearly all patients with MS. However, when contraindications to regional anesthesia are present, general anesthesia can be safely administered for cesarean delivery, there must be avoidance of significant increases in heart rate, SVR, and PVR commonly associated with induction and emergence. (3)

Thus, when there is no contraindication and in mild to moderate mitral stenosis regional anesthesia is preferred. Mechanism of EVE is most commonly explained as thecal compression as a result of volume effect on consequent epidural injection. This compression of thecal space causes cephalad shift of local anaesthetic within the cerebrospinal fluid, raising the level of sensory block. Imaging studies document thecal compression following EVE and several studies demonstrate an increase in post-spinal sensory block following epidural injection of normal saline. (4) Combining the rapid onset and intensity of subarachnoid block along with the advantage of an indwelling epidural catheter, which allows perioperative extension of anesthesia. In parturients undergoing caesarean section, Blumgart et al. showed that epidural volume extension with 10 ml of either bupivacaine 0.5% or saline, administered 5 min following the subarachnoid injection of 8 or 9 mg hyperbaric bupivacaine, resulted in a similar increase in sensory block height of four segments compared with a control group receiving no extradural injection. (8) Usage of NIV is seen to rapidly improve the respiratory distress and reduce the need for intubation and even mortality in patients with acute cardiogenic pulmonary edema (ACPE). (5) A number of randomized clinical trials (RCTs) support the use of NIV in patients with these diseases and in addition to the beneficial role in reducing patients' symptoms it showed reduction in morbidity and mortality and length of ICU and total hospital stay. Also, because NIV avoids the invasion of airway it has less infectious complications like ventilator associated pneumonia (VAP). (6)

CONCLUSION:

RHD in pregnancy must be carefully evaluated and plan of anesthesia also helps us prevent certain complications. Perioperative care in such parturients is of utmost importance as they may present with cardiogenic pulmonary edema 24-72 hours postoperatively. Haemodynamic stability should be maintained. Thus low dose spinal anesthesia with epidural catheter in situ helped in maintaining the stable hemodynamics and post operative analgesia in our case.

Authors contribution:

NS Rashmi – Data acquisition and manuscript preparation

Jadhav Arati- Data analysis

Kulkarni Kalpana- Manuscript editing

Chavan Rashmee- Manuscript review

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