

CASE REPORT

Anesthetic management in a patient with mitral stenosis associated with pregnancy induced hypertension

Pravin Ubale, MD¹, Chinmayee Patkar², Charu Thombre³

¹Associate Professor; ²Assistant Professor; ³Resident
Department of Anesthesiology, TNMC & BYL Nair Hospital, Mumbai (India)

Correspondence: Dr. Pravin Ubale, Anand Bhavan, B-16, TNMC & BYL Nair Hospital, Mumbai Central, Mumbai (India); Tel: 9322211472; E-mail: drpravinubale@gmail.com

ABSTRACT

Patients with mitral stenosis associated with Pregnancy Induced Hypertension (PIH) continue to pose a challenge to anesthesiologist and could be associated with an unfavorable maternal as well as fetal outcome. Women with mitral stenosis often do not tolerate the cardiovascular demands of pregnancy. This increased volume load and tachycardia together cause the patients to deteriorate and advance from one New York Heart Association (NYHA) class to another. We report a 28 year female, who underwent cesarean section under combined spinal-epidural anesthesia (CSEA). The uneventful course of the anesthesia in the presented case was due to the thorough systemic evaluation and careful anesthetic strategy.

Key words: Mitral stenosis; Pregnancy induced hypertension; PIH, Cesarean section; Combined spinal epidural anesthesia; CSEA

Citation: Ubale P, Patkar C, Thombre C. Anesthetic management in a patient with mitral stenosis associated with pregnancy induced hypertension. *Anaesth Pain & Intensive Care* 2015;19(4):499-501

INTRODUCTION

Rheumatic heart disease at present is the most common cardiac disorder in pregnancy with mitral stenosis as a single most prevalent lesion.¹ A pregnant patient with mitral stenosis associated with pregnancy induced hypertension is a unique challenge to the obstetrician and anesthesiologist. Maternal and perinatal complications during pregnancy in women with mitral stenosis reflect the unfavorable interaction between the normal cardiovascular changes of pregnancy and the stenotic mitral valve. Cardiac disease has the potential to remain undiagnosed, it may present with cardiovascular decompensation during pregnancy, at the time of delivery or immediately postpartum. We hereby report a successful combined spinal epidural anesthesia (CSEA) technique for cesarean section in a patient with mitral stenosis associated with pregnancy induced hypertension (PIH).

CASE REPORT

A, 28 year old, gravida 2 para 1 was referred to our

institute for emergency cesarean section in view of failure of labor to progress. She was a diagnosed case of mitral stenosis in her previous pregnancy and was on benzathine penicillin prophylaxis since 2 years. Also she was a diagnosed case of PIH in this pregnancy during second trimester and was started tablet α -methyl dopa 500 mg QID. Her previous cesarean section was done under spinal-epidural anesthesia which went uneventful. She complained of intermittent episodes of dyspnea on exertion and paroxysmal nocturnal dyspnea since second trimester. She also had complaints of cough with expectoration since 2 days. On clinical examination her heart rate was 78/min and arterial pressure was 170/100 mmHg. On auscultation bilateral basal crepitations, along with mid-diastolic murmur with loud second heart sound, were heard at the apex. All biochemical investigations including coagulation profile were within normal limits. Echocardiography revealed mitral valve area of 1.2 cm², mean gradient across the mitral valve of 18 mmHg, pulmonary artery systolic pressure of 60

mmHg and ejection fraction of 60%. Wilkins score was $M_2T_3S_2C_2 = 9/16$.

High risk consent was obtained and patient was explained the advantages and disadvantages of both general and regional anesthesia and finally it was decided to employ combined spinal epidural anesthesia (CSEA) technique for the patient. Electrocardiogram, pulse oximetry and non-invasive blood pressure were monitored. Anti-aspiration prophylaxis was given with inj. ondansetron 4 mg and inj. ranitidine 50 mg intravenously prior to induction. With all aseptic precaution intravenous access was obtained with 18G cannula on left side and internal jugular vein was cannulated with 7-French triple lumen catheter on right side. Central venous pressure was found to be 6 to 8 cm of H_2O . Preloading was done with only 100 ml of hydroxyl ethyl starch 6% (Voluven®). We opted for CSEA technique in sitting position, epidural space was obtained with a 16G Tuohy needle by loss of resistance technique. Spinal anesthesia was then performed using a needle through needle technique employing a 26G Quincke spinal needle. Spinal anesthesia was administered with 0.5 ml of 0.5% bupivacaine and 25 μ g of fentanyl and epidural catheter was fixed at 10 cm mark. Patient was then positioned supine with a 15-degree left lateral tilt. Sensory block achieved by giving CSEA technique was upto T10 segment. After 5 mins 3 ml of 2% adrenalized lignocaine was given through epidural catheter to achieve sensory level of T₆ segment. Oxygen was administered through a facemask at 4lit/min. 2.8 kg female baby was delivered with good apgar scores. Inj. Oxytocin 20 units in 500ml DNS was started at a rate of 100ml/hr. Intravenous Inj. frusemide 10mg was given after cord clamp. Oxygen saturation was maintained between 97% and 99%, heart rate between 70 to 90/min and blood pressure was maintained between systolic (110 to 150 mmHg) and diastolic (70 to 90 mmHg) with urine output of 200 ml intraoperatively. Patient was shifted to intensive care unit for postoperative monitoring. Postoperative analgesia was provided with 6 ml of 0.1% bupivacaine and 50 mg tramadol 8 hourly through epidural catheter. On 2nd post-operative day she was hemodynamically stable with clear lung fields and was shifted to the ward.

DISCUSSION

Mitral stenosis occurs most commonly as a result of rheumatic heart disease. Mitral stenosis is one of the most common valvular lesion in the parturients especially in the underdeveloped

countries. Other valvular lesions associated with rheumatic fever like mitral regurgitation, aortic stenosis and aortic regurgitation are less frequent. Complications related to mitral stenosis include; increased incidence of maternal cardiac failure and mortality, increased risk of premature delivery, low APGAR scores and lower birth weight. Pulmonary hypertension is associated with greatly increased maternal risk and moderately increased neonatal risk, with peripartum mortality of 30 to 56% and 10 to 13% respectively.²

Pregnancy is associated with normal physiological changes that have important consequences on hemodynamics in patients with underlying heart disease. Pregnancy is detrimental to cardiac function in the patient with mitral stenosis for several reasons. The expanded blood volume can increase the risk of pulmonary congestion and edema. The physiologic tachycardia in pregnancy decrease the left ventricular filling time, results in elevated left atrial pressure, can lead to edema and decreased onward flow of blood, resulting in hypotension, fatigue and syncope.³

Preoperative management of the pregnant women with mitral stenosis should include reducing the heart rate and left atrial pressure by restricting physical activity and administering a beta-adrenergic receptor blockage.⁴ Our patient was not on beta blockers. It was an emergency cesarean section so patient was not properly optimized. Anesthetic considerations in patients with mitral stenosis are as follows: (A) Avoid sinus tachycardia; (B) Avoid marked increase in central blood volume; (C) Avoid drug- induced decrease in systemic vascular resistance; (D) Avoid events, such as arterial hypoxemia and hypoventilation, that may exacerbate pulmonary hypertension and evoke right ventricular failure.

In our patient we preferred CSEA technique over conventional general anesthesia and spinal anesthesia. During general anesthesia cardiovascular effects associated during laryngoscopy and tracheal intubation in patients with mitral stenosis associated with pregnancy induced hypertension may produce increase in pulmonary artery pressure and tachycardia during laryngoscopy and tracheal intubation. Moreover, the adverse effects of positive-pressure ventilation on the venous return may ultimately lead to cardiac failure. Also during pregnancy gastric emptying is delayed, increasing the risk of aspiration of gastric contents during

general anesthesia. A single shot spinal technique is not recommended because the rapid decrease in systemic vascular resistance associated with this technique may not be well tolerated in patients with mitral stenosis associated with pregnancy induced hypertension patients.

CSEA technique has been used effectively to provide anesthesia for cesarean section.⁵ CSEA had a lower failure rate. The spinal component gives a rapid onset of a predictable block, and the indwelling epidural catheter gives the ability to provide long lasting analgesia and allows titration of the dose to the desired effect. Intraoperative patient satisfaction, anxiolysis and postoperative pain scores have been reported to be superior with CSEA.⁶ Also it results in lower maternal and umbilical cord blood concentrations of the local anesthetics.⁶

The patient's hemodynamic status was carefully observed and fluid management was guided by central venous pressure. In intensive care unit special attention was given to fluid restriction, diuresis and epidural analgesia due to which patient's recovery became very faster.

In conclusion our case report demonstrates the cesarean section in patients with mitral stenosis associated with pregnancy induced hypertension can be safely performed under combined spinal-epidural anesthesia technique with strict hemodynamic and meticulous cardiovascular monitoring along with good postoperative intensive care.

Conflict of interest: None declared by the authors.

Author contribution: All of the authors took part in the management of this patient and in manuscript preparation.

REFERENCES

1. David H Chestnut. Principles and Practice of Obstetric Anaesthesia. Elsevier Mosby-Philadelphia, Pennsylvania; 3:p707-33; 2004.
2. Weiss BM, Zemp L, Seifert B, Hess OM. Outcome of pulmonary vascular disease in pregnancy: a systematic overview from 1978 through 1996. J Am Coll Cardiol 1998;31: 1650-7 [PubMed]
3. Klein LL, Galan HL. Cardiac diseases in pregnancy. Clin Obstet Gynecol. N Am 2004;31:429-59. [PubMed]
4. Hurst AK, Hoffman K, Frishman W H. The use of B-adrenergic blocking agents in pregnancy and lactation. In: Elkayam U, Gleicher N, editors. Cardiac problems in pregnancy. New York, NY: Wiley-Liss;1999;351-90.
5. Fan SZ, Susetio L, Wang YP, Cheng YJ, Liu CC.. Low dose of intrathecal hyperbaric bupivacaine combined with epidural lignocaine for caesarean section-a balance block technique. Anaesth Analg. March 1994;78(3):474-7 [PubMed]
6. Rawal N, Sabollin J, Westrom G. Epidural versus Combined spinal epidural block for caesarean section. Acta Anaesthesiol Scand 1988;32:61-6 [PubMed]

★ ★ ★ ★ ★

TACON 2016
Ahmedabad, Gujarat, India



PLEASE JOIN US ON 26TH – 28TH AUG 2016