

Anaesthetic Management of a Case of Pregnancy with Rheumatic Heart Disease with Active Varicella Presenting for Caesarean Section

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Abstract

Introduction: The varicella zoster virus (VZV), a DNA virus in the herpes family, causes chickenpox, a generally mild but contagious illness. About 5-10% of pregnant women lack VZV antibodies and can contract varicella during pregnancy. The impact of primary VZV infection varies with the gestational period: maternal complications are highest in the third trimester, while fetal risks are greatest in the first and second trimesters. Mitral stenosis from rheumatic fever is the most common valvular heart disease in pregnancy, usually emerging due to cardiovascular changes. Improved care has reduced related mortality and morbidity.

Case Report: A 25-year-old female diagnosed with G2P1L1 with 36 weeks 4 days gestation with active varicella infection with rheumatic heart disease in latent labour, posted for emergency LSCS. Thorough pre-anaesthetic evaluation was done to assess patient's ability to respond to physiological challenges encountered intraoperatively. Patient presented to the hospital with complaints of breathlessness and active varicella infection for 2 days. Patient had not been diagnosed with any other co-morbidities prior to this. In view of breathlessness, ECG, chest X-ray and 2D echo was done and patient was found to have RHD with sever MS, sever TR, sever PAH with preserved EF of 60%.

General anaesthesia was performed and patient was induced with thiopentone and fentanyl, patient was intubated with endotracheal tube, maintained with isoflurane, vecuronium. Patient was started on inj. Furosemide 0.5ml/hr intra op. Blood gas analyses done intraoperatively to correct metabolic, electrolyte disturbances, blood sugars monitored for glycemic control, adequate volume replacement was done with crystalloids. Post-operatively patient was shifted to ICU with endotracheal tube for postoperative elective ventilation, extubated the following day.

Conclusion: Numerous hemodynamic factors must be evaluated to determine the suitable anaesthesia for caesarean section in sever RHD patients. Both regional and general anaesthesia have been administered for caesarean sections in parturients with varicella. When selecting anaesthesia technique, its essential to thoroughly weigh the risk and benefits of general anaesthesia and central neuraxial block.

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Key Messages: In managing anaesthesia for a caesarean section in a pregnant patient with rheumatic heart disease and active varicella, prioritize careful cardiovascular monitoring and adjust anaesthetic techniques to accommodate the heightened risks of both the heart condition and the viral infection. Comprehensive preoperative assessment and multidisciplinary teamwork are crucial to ensure optimal maternal and fetal outcomes while managing potential complications from both conditions.

INTRODUCTION:

The varicella zoster virus (VZV), a DNA virus in the herpes family, causes chickenpox, a primary contagious and typically mild illness. Approximately 5–10% of pregnant women do not have antibodies to VZV and can contract varicella during pregnancy. The effects of primary VZV infection during pregnancy vary depending on the gestational period. The risk of complications for the mother is highest in the third trimester, while the risk for the foetus is greatest in the first and second trimesters.

Mitral stenosis due to rheumatic fever is the most common valvular heart disease in pregnancy. The normal mitral valve area is 4-6 cm², but symptoms appear when it decreases to 2 cm². This condition often first presents during pregnancy due to physiological cardiovascular changes. Improved obstetric and anaesthetic care have significantly reduced mortality and morbidity associated with this disease.

CASE REPORT

A 26 year old female patient, G2 P1 L1 with 36 weeks 2 days gestational age, was referred from government hospital. In emergency department she complained of fever, malaise followed by development of rash since 3 days, she also complained of breathlessness since 3 days. Lesions were first began on face then progressed to the trunk and abdomen, patient had not been previously immunised and did not have any history of previous exposure to varicella. Patient was started on Tab. Acyclovir since 2 days. On doing pre anaesthetic examination the patient was diagnosed with active varicella infection and Rheumatic heart disease with sever MS. The 2D Echo revealed thick and doming mitral valve with sever mitral stenosis, sever PAH (RVSP 60MMHG) with preserved EF 60%, MVOA- 1.25QCM.

The patient underwent emergency LSCS due to latent labor and was administered general

anaesthesia due to extensive skin lesions and RHD. The patient had been NPO for 6 hours. Informed consent was obtained for high-risk procedures. Two 18 gauge IV accesses were established in the upper arm. Electrode placement for 5-lead ECG monitoring (II and V5), noninvasive blood pressure (NIBP), and pulse oximetry was completed. Baseline vital signs were as follows: heart rate 110/min, NIBP 130/70 mmHg, respiratory rate 16/min, and SpO₂ of 88%. The patient was induced with thiopentone, intubated with an endotracheal tube, and maintained on isoflurane and vecuronium. Intraoperatively, the patient received inj. Furosemide at 0.5 ml/hr. Blood gas analyses were conducted intraoperatively to address metabolic and electrolyte disturbances, and blood sugar levels were monitored for glycemic control. Adequate fluid replacement was achieved with crystalloids. Following delivery, oxytocin infusion (15 units in 500 ml Ringer's lactate) commenced at a rate of 100 ml/h, with avoidance of bolus dosing. There were no incidents of hypotension, tachycardia, bronchospasm, or desaturation during the intraoperative period. The surgery lasted 45 minutes, with total blood loss amounting to 800 ml. Post-surgery, the patient was transferred to the ICU with the endotracheal tube in place and extubated the following day, subsequently being moved to the wards with a healthy baby on the second day.

DISCUSSION

RHD

The physiological alterations that transpire during pregnancy can pose risks to individuals afflicted with mitral stenosis. When the valve area diminishes to <2.0 cm², a pressure differential develops across the valve.¹ This escalation in left atrial pressure (LAP) is echoed into the pulmonary venous system, heightening the likelihood of pulmonary edema. If left untreated, this can culminate in pulmonary arterial hypertension, potentially resulting in elevated right ventricular pressures and, in severe cases, right ventricular failure. For symptomatic patients grappling with moderate to severe mitral

stenosis and serious pulmonary hypertension.

Beta blockers and diuretics continue to be the cornerstone of medical management for symptomatic patients during pregnancy. Mitral valve surgery is reserved for those who do not respond to medical treatment and are not suitable candidates for valve repair because cardiovascular surgery during pregnancy is linked to increased fetal mortality. Our patient with a valve area of 1.2cm² exhibited signs of pulmonary edema.²

After the procedure, she was prescribed beta blockers and diuretics and remained asymptomatic until her due date when she developed a respiratory tract infection. Despite symptoms resembling pulmonary edema, the diagnosis pointed to an infectious origin based on fever and elevated white blood cell count. The presence of respiratory tract infection complicates the management of cesarean section in patients with mitral stenosis.⁵

Neuraxial blockade in individuals with mitral stenosis reduces systemic vascular resistance, cardiac preload, and induces reflex tachycardia. A one-time spinal anesthesia is not recommended for pregnant patients with significant mitral stenosis. Regional anesthesia has gained popularity recently as a safe option for cesarean sections in all pregnant women, including those with heart disease. The main concerns with neuraxial blockade are the hemodynamic changes it induces. Epidural anesthesia is generally preferred over spinal anesthesia. However, there has been debate regarding the use of neuraxial blockade in severe MS patients due to their fixed cardiac output state, which may not tolerate the associated decrease in systemic vascular resistance.

Varicella

Varicella, commonly known as chickenpox, is an acute and highly contagious disease that is typically mild and self-limiting in childhood but can lead to severe complications in adults and those with weakened immune systems. Complications may include secondary bacterial skin infections. Varicella pneumonia is the most frequent complication post-infection, with additional risks such as myocarditis, corneal lesions, nephritis, arthritis, bleeding tendencies, acute glomerulonephritis, and hepatitis in adults. Skin lesions, neurological impairments, eye defects, intrauterine growth restriction (IUGR), hypoplasia, and developmental delays may result from direct viral damage during fetal development in congenital varicella syndrome.³

Maternal varicella poses several considerations for anesthesiologists. The use of spinal or epidural blocks could potentially expose the central nervous system to the virus, leading to meningitis or encephalitis. However, some studies suggest that using a blunt-tip needle instead of a sharp-tip needle may reduce the risk of introducing viral material into the CNS.⁴

The primary concern with general anesthesia is postoperative pneumonia. There is evidence indicating that general anesthesia can suppress immune function. Nitrous oxide and inhalational agents like isoflurane, sevoflurane, and desflurane have all been implicated. Risk factors for varicella pneumonia include maternal smoking, third-trimester pregnancy, more than 100 skin lesions, and presence of pharyngeal lesions. If general anesthesia is necessary, it may be advisable to avoid inhalational agents by using opioids, muscle relaxants, and 100% oxygen.

CONCLUSION

Numerous hemodynamic factors must be evaluated to determine the suitable anaesthesia for caesarean section in severe RHD patients. Both regional and general anaesthesia have been administered for caesarean sections in parturients with varicella. When selecting anaesthesia technique, its essential to thoroughly weigh the risk and benefits of general anaesthesia and central neuraxial block.⁵

Conflict of Interest: None

REFERENCES

1. Nataraj MS, Giri V. Anesthetic management of cesarean section with mitral stenosis and respiratory tract infection. *J Obstet Anaesth Crit Care* 2014;4:78-80.
2. Bansal UV et al. *Int J Reprod Contracept Obstet Gynecol.* 2020 Nov;9(11):4759-4761.
3. Ohri R, Vyas V. Anesthetic Implications in a Primigravida Posted for Cesarean Section with Varicella Zoster Infection. *J South Asian Feder Obst Gynae* 2018;10(4):291-292.
4. Dave,Sasane,Iyer. Anaesthesia for LSCS in PT with varicella. *Indian J. Anaesth.* 2007;51(2):140-142.
5. MFMR,Sinha A,PatelJ. Rheumatic Heart Disease in Pregnancy. *Heart Views.* 2020;21(1):31-40.