

## Anesthetic Management of Primigravida with Varicella Zoster Infection Undergoing Elective Caesarean Section

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### Keywords

general anesthesia, subarachnoid block, infectious disease, varicella zoster (chicken pox), parturient, central nervous system infection, varicella pneumonia, anesthesia

### Abstract

During pregnancy incidence of varicella infection is low. However, both the pregnant woman and the foetus are at a high risk of substantial death and morbidity. The third trimester is when a pregnant woman is most at risk for life-threatening complications, and pneumonia is the main reason for maternal death. We present a case report of 24 years primigravida with 39.5 weeks gestational age with acute varicella infection posted elective cesarean section, and discuss the anesthetic management, and various concerns regarding the choice of anesthesia.

### 1. Introduction

The extremely contagious deoxyribonucleic acid (DNA virus known as varicella zoster (VZ).When the varicella-zoster virus (VZV) reactivates after causing chicken pox as the initial infection, shingles or herpes zoster develops. Varicella zoster( Chickenpox) is typically a benign childhood disease usually characterized by an exanthematous rash and is uncommon in adults. However parturient is more susceptible to complications. The severity of the disease, varicella complications that may be present, the length of antiviral therapy, and the course of the disease naturally all

influence how these individuals are managed under anesthesia. Here, we outline the anesthetic management of cesarean delivery in a primigravida who has varicella zoster infection and various related concerns.

### 2. Case Presentation

A 24-year-old ( 66 kg weight,160 cm height ) primigravida was admitted to our hospital at 39.5 weeks gestational age with varicella infection for conduction of safe confinement. At the time of admission, she gave a history of fever, cough dry in nature, and malaise eight days before admission followed by the development of

a maculopapular rash which first began to appear on her face as macules and papules then became pustular as progressed to trunk and abdomen two days after fever. She had no history of exposure to varicella and had not been previously immunized. She was started on acyclovir therapy by a government medical officer. No further affliction was identified based on her medical records and medical history. Her blood test results were normal. She was afebrile, with a heart rate of 86 beats per minute, blood pressure of 128/78 millimeters of mercury, a respiratory rate of 17 beats per minute, and a saturation level of 98% on room air. On chest auscultation, air entry was bilateral and equal in both lung fields and no conductive sounds were heard. The electrocardiogram was within normal limits, and the chest x-ray showed no evidence of varicella pneumonia. She was nil by mouth(NBM) for seven-hour. She was given a prophylactic antibiotic before surgery. A wide-bore 18G intravenous cannula was secured and all the other monitors were attached( Electro-cardiogram, blood pressure cuff, and saturation probe). A subarachnoid block was decided upon following a thorough conversation with the obstetrician because the patient and her spouse were not willing to undergo surgery under general anesthesia. The lumbar region, which was free of rashes, was cleaned and prepped with antiseptic solutions as she was positioned in the left lateral position. A 25 G pencil point spinal needle was used to administer 10 mg of hyperbaric bupivacaine intrathecally. With a birth weight of 2.5 kg, an Apgar score of 8 at 1 minute, and a score of 9 at 5

minutes, a male neonate was born after 15 minutes of the subarachnoid block. The infant was moved to the neonatal critical care unit for additional evaluation and treatment. She lost 700 ml of blood in total, and up until the surgery was through, she was given 2.5 liters of Ringer's lactate. During the procedure, she was given 20 international units of oxytocin through infusion. She was moved to the postoperative recovery room after the procedure, where all monitoring devices were attached. For postoperative discomfort, the patient was given 1gm of paracetamol intravenously every six hours. When necessary, injection tramadol 50 mg intravenously was given as a rescue analgesic. During her whole time in the recovery room, her hemodynamics remained steady. anti-viral drugs(800 mg of acyclovir orally five times per day) and antimicrobial drugs were continued for five days after surgery. Her post-operative hospital stay was uncomplicated, and her rash progressively went away over the course of the following five days. The newborn was maintained in the neonatal ICU for one day before being moved to the mother's side.

### 3. Discussion

The varicella-zoster virus, which only exists in humans, is what causes varicella (chickenpox). It is a very contagious illness, with at least 90% of susceptible (seronegative) people experiencing an attack.

According to Blott M, et al. The rashes, low-grade fever, and malaise with prodromal symptoms appear after an incubation period of 14 to 17 days [1].

According to Warachit B, et al, the skin lesions at different stages of the illness include maculopapular, vesicles, and scabs. Patients are contagious for 48 hours before to the appearance of the rash and until all vesicles have crusted over. In its lesser forms, it is self-limiting, although complications can still happen, especially in individuals who are immunocompromised. The most frequent side effect is a subsequent bacterial infection of the skin lesions brought on by staphylococcus aureus or streptococcus pyogenes [2]. The CNS in children and the lungs in adults are the two extracutaneous sites that are most frequently affected. Aseptic meningitis, encephalitis, transverse myelitis, and Guillain-Barre syndrome can all be brought on by varicella infection. Myocarditis, ocular lesions, nephritis, arthritis, bleeding diatheses, acute glomerulonephritis, and hepatitis are among further potential effects. Pregnancy-related varicella is not unusual. Additionally, Goldman G. et al. discovered that the third trimester is when there is the greatest danger for maternal difficulties, but the first trimester is when the fetus is most affected. Due to direct transplacental transmission of the virus and a lack of antiviral antibodies, if the maternal infection occurs between 4 and 7 days before delivery and 48 hours after delivery, the neonatal varicella is usually severe. The anesthesiologist has various concerns about a pregnant woman scheduled for a cesarean section who has active varicella [3].

The choice of anesthetic technique presents the biggest conundrum. Due to the significant risk of varicella pneumonia,

Harris JA, et al advocated regional anesthetic in pregnant women with varicella [4]. Due to the significant risk of varicella pneumonia, regional anaesthesia is recommended for pregnant varicella patients [4].

However, due to the presence of viremia, Landon MB, et al advised against using regional anaesthetic for two weeks following the onset of symptoms. Due to the dearth of randomised controlled studies in these patients, there are no recommendations or sources of strong data for the selection of anaesthetic modality [5]. The decision to use spinal anaesthetic in this instance was made out of concern for the possibility of varicella pneumonia.

Additionally, the patient did not want to undergo surgery under general anaesthesia. According to Kutukculer N. et al., the use of neuraxial anaesthetic procedures is under discussion because it's probability to infect the central nervous system (CNS) while placing the block. During the initial infection, when viremia is present, the likelihood is significantly higher. Another issue is the difficulty in separating post-dural puncture pain from headache brought on by CNS illness [6]. In pregnant people with HIV infection, a comparable justification can be made. However, it was suggested by Blott M. et al. and Warachit B. et al. that there is no proof that HIV can transmit to the central nervous system through the neuraxial blockade in the pregnant person who is HIV-positive. The safest and most effective technique for parturients with HIV infection is neuraxial anaesthesia [1,2]. The use of pencil-point spinal is preferred since it will avoid tissue coring and lower the possibility of

transferring infectious viral material into the central nervous system. However, since during systemic varicella infection, when the virus remains dormant until it reactivates, resulting in a zoster, the dorsal root ganglion becomes infected. The neuraxial involvement of the virus can happen naturally and independently of the block. Additionally, our patient was treated with acyclovir for two days before to surgery. Acyclovir prevents the varicella-zoster virus (VZV) from replicating, and 24 hours after starting acyclovir medication, viral activity cannot be found in peripheral blood. Therefore, the risk of infection might theoretically be decreased by receiving proper antiviral medication for at least 24 hours. Since the interspinous area in the lumbar region remained unaffected by the rash in this instance, a successful spinal block was possible. The preferred anaesthesia strategy would be general anaesthesia in patients who have significant skin involvement at the block placement location. In our opinion, a neuraxial block is safe and ought to be favoured in varicella-infected pregnant women who have received antiviral medication for longer than 24 hours and in whom the block's placement site is unaffected. However, during the recovery phase, it is important to think about neurological surveillance and antiviral treatment. The possible risk of viral pneumonia, which has a high morbidity and mortality rate, is the main worry with the use of general anaesthesia approach. We chose regional anaesthetic over general anaesthesia because our patient's lack of willingness to cooperate, history of fever, dry cough eight

days before to admission, as well as the fact that the lumbar area was clear of maculopapular rashes. The most severe complication after chickenpox, varicella pneumonia, occurs more frequently and severely in pregnant women than in the broader adult immunocompetent population, and in adults (up to 20% of cases) than in children. Only one to five pregnancies out of every 10,000 have primary varicella infections, but because respiratory failure is so common, untreated varicella pneumonia during pregnancy can have a death rate as high as forty-five percent. Fever, tachypnea, dyspnea, cough, pleuritic chest discomfort, and hemoptysis are some of the clinical signs and symptoms of varicella pneumonia that manifest three to five days following the start of the illness. Intubation and artificial breathing are required in 10% of adult varicella patients. Pregnancy increases to triples the risk of pulmonary issues for the mother in the third trimester due to secondary immunosuppression and changes in lung compliance. Patients are more likely to get pneumonia if their mothers smoke, if they have more than 100 skin lesions, or if they have pharyngeal lesions. Acyclovir should be started as soon as possible to treat varicella pneumonia regardless of the disease's stage; nevertheless, if it is provided, it lowers maternal mortality from 45% to less than 20% within 72 hours of the onset of dyspnea. Given the substantial mortality and morbidity rates linked to varicella pneumonia during pregnancy, all pregnant women with varicella should be closely monitored. Using general anesthesia on these people may increase their chance of



developing pneumonia because of changes in lung mechanics and a reduction in the immune response. It was advised against using nitrous oxide or inhalational anesthesia on a pregnant patient who had varicella since these substances are known to inhibit the immune response. Our opinion is that pregnant women with active varicella who have symptoms that could be the onset of pneumonia or any of the risk factors for the development of varicella pneumonia should avoid general anesthesia. Early antiviral treatment and intensive surveillance for the detection of pneumonia will reduce the complications from varicella pneumonia if general anesthesia is necessary for a caesarean section in a pregnant varicella patient. of varicella pneumonia. If general anaesthesia is required for a caesarean section in a pregnant varicella patient, early antiviral medication and extensive surveillance for the identification of pneumonia will lessen the complications from varicella pneumonia. As soon as feasible, zoster immunoglobulin should be given to a newborn whose mother had varicella. Although acyclovir prophylaxis is not advised for these infants on a regular basis, it should be begun right once if varicella infection develops.

Although VZV exposure or infection confers immunity, a secondary infection is still possible. Therefore, all medical staff members should exercise caution and limit their contact with the infectious patient. In unimmunized individuals, within 72 hours, zoster immunoglobulin can be administered prophylactically to prevent or decrease varicella infection. There is a vaccination for varicella that offers >70%

protection against infection and >90% severity reduction in participants for 7 to 10 years. For the protection of infection, routine immunisation is advised for all healthcare professionals. In order to lessen the severity of infection, vaccinations should be given to all susceptible women of childbearing age. Vaccination is not advised, though, while pregnant. In conclusion, a central neuraxial block, when administered after the proper antiviral therapy has been started, is safe and ought to be favoured in pregnant women with active varicella infection. If the neuraxial method was employed, postoperative antiviral medication should be continued, and neurological monitoring should be taken into consideration. Although it has been utilised on these patients, general anaesthesia should ideally be avoided when there are known risk factors for varicella pneumonia. The perioperative period should be used to monitor all patients for the emergence of varicella pneumonia, which should be aggressively treated with the proper antiviral therapy. The prophylactic and preventive measures against varicella infection should be known to medical personnel. The precautions and prophylactic measures against varicella infection should be known by the staff.

#### 4. Conclusions

We have come to the conclusion that both regional and general anesthesia can be employed, but the benefits and drawbacks of each approach should be carefully considered.

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