

Cesarean section and Spinal Anesthesia Consideration in Preeclamptic Patient with Thrombocytopenia and COVID-19 Infection

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ABSTRACT

Background: Coronavirus Disease 2019 (COVID-19) has become a world health emergency. Pregnant women and newborns are two groups of people who are susceptible to disease. Corona virus infection in 2019 has been associated with systemic consequences such as high blood pressure, kidney disease, thrombocytopenia, and liver damage. Anesthetic management of emergency cesarean section in a preeclampsia patient with thrombocytopenia and COVID-19 infection is described in this case report..

Case: A 30-year-old woman, G2P1A0 (Gravida: 2, Partus: 1, Abortus: 0), 38 weeks pregnant, came to our hospital complaining of irregular contractions. In addition, the patient had a fever and cough. After 24 hours of testing, a positive test result for COVID-19 was obtained. The patient is then immediately sent to the isolation room. Contractions began regularly within 5 hours, and cervical examination revealed a dilation of 2 cm. Due to the positive impact of COVID-19, the obstetrics and gynecology department chose to undergo a cesarean section. The cesarean section procedure was carried out according to the COVID-19 operating protocol.

Conclusion: Patient with severe thrombocytopenia can safely use spinal anesthesia, while COVID-19 patient should avoid general anesthesia to reduce transmission.

Keywords: preeclampsia, regional anesthesia, cesarean section, COVID-19, thrombocytopenia

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INTRODUCTION

Coronavirus Disease 2019 (COVID-19) has become a global health emergency. Pregnant women and newborns are two groups of people who are susceptible to disease. Because there is little data on the effects of COVID-19 on pregnancy, healthcare practitioners face unique challenges.¹ In a study of 108 pregnant women infected with COVID-19, it was found that 91% of pregnant women gave birth by cesarean section. Corona virus infection in 2019 has been associated with systemic consequences such as high blood pressure, kidney disease, thrombocytopenia, and liver damage. COVID-19 infection causes preeclampsia by increasing ACE-2 receptor expression in utero.² In addition, most women who deliver by cesarean have thrombocytopenia and elevated C-reactive protein, which can exacerbate COVID-19 and neurological problems. During a normal pregnancy, the mean platelet count falls by about 20%, and 5.8% of all women giving birth have a count below 100,000/mm³.³ 70%-80% of thrombocytopenia during labor is due to gestational thrombocytopenia, while 20% and 3%-4% of cases are due to hypertensive disease and immune thrombocytopenic purpura.²

Thrombocytopenia is a common hematologic finding in COVID-19 patients, accounting for approximately one third of all cases.² Thrombocytopenia has important concerns for the safe performance of spinal anesthesia in COVID-19-affected women who give birth, especially when urgent decisions regarding delivery have to be made. The presence of COVID-19 does not preclude the use of spinal anesthesia. Because the advantages outweigh the harm, spinal anesthesia is used.¹ Anesthetic management of emergency cesarean section in a preeclamptic patient with thrombocytopenia and COVID-19 infection is described in this case report.

CASE

A 30-year-old woman, gravida 2, para 1, and 38 weeks pregnant, came to the emergency department of our hospital, with irregular contractions, fever and cough. The patient was then given a COVID-19 screening test because she had COVID-19 symptoms. The patient had a severe headache for five days before being admitted to the hospital. The patient was diagnosed with preeclampsia when she was 26 weeks pregnant, and she has been taking 30 mg of long-acting nifedipine since then. Fetal movements are still felt by the patient. The patient said she had

experienced preeclampsia in his previous pregnancy history. In addition, the patient had undergone a cesarean section in a history of previous pregnancies. The patient denied having diabetes, allergies, asthma, smoking, or consuming alcoholic beverages.

The patient was fully conscious on physical examination, with a blood pressure of 195/105 mmHg and an SpO₂ of 94%, and all other physical examinations within normal limits. The patient weighs 61 kg, height 157 cm, and BMI 24.7 kg/m². Three-finger mouth opening and grade II mallampati were found during airway examination. Peristaltic movements were normal, fetal heart rate was 145 beats per minute, contractions began to be palpable, uterine fundal height was 32 cm, and head presentation was seen during abdominal examination.

Blood examination revealed thrombocytopenia 55,000/mm³, INR 0.82, APTT-35.3 seconds, fibrinogen 524 mg/dL, and D-Dimer 337 ng/mL. Urinalysis results found +3 proteinuria. Chest X-ray (Figure 1) showed infiltrates in both lungs, the costophrenic angle was normal, normal and there was no tracheal shift. So the patient is suspected of contracting COVID-19.



Figure 1. Chest X-Ray Examination

After 24 hours of testing, a positive test result for COVID-19 was obtained. The patient is then immediately sent to the isolation room. Contractions began regularly within 5 hours, and cervical examination revealed a dilation of 2 cm. Due to the positive impact of COVID-19, the obstetrics and gynecology department chose to undergo a cesarean section. The cesarean section procedure was carried out according to the COVID-19 operating protocol.

The patient was fasted for 6-8 hours and given oxygen 3 lpm, Intravenous Fluid Drops (IVFD) Ringer Lactate 12 bpd, azithromycin 500 mg (IV), acetaminophen 1 gram orally, MgSO₄ 20% 4 grams intravenously and continued with MgSO₄ 20% 1 gram/hour for 24 hours, nifedipine 3x10 mg orally, and furosemide 40 mg/12 hours intravenously. Anesthesiologists use spinal anesthetic techniques for cesarean sections to ensure patient and operator safety. Due to the low platelet count, four platelet units were transfused 90 minutes before surgery, followed by another 30 minutes. Reassessment of platelets resulted in a value of 66,000/mm³. Four platelet units were also transfused during the procedure. The patient was transferred to a special operating room for COVID-19 patients while wearing an N-95 mask. Hazmat gowns, double gloves, standard bouffant hats, N95 masks, and protective eyewear are worn by the delivery operator and nurse.

To facilitate fluid resuscitation, the patient is placed in the supine position and provided for two-way intravenous access. Using a Tuohy 18G needle, the anesthesiologist

administered 75 mg lidocaine and 25 mcg fentanyl into the VL 3-4 intervertebral area. Ringer's lactate infusion, 4 platelet unit transfusions, 8 mg of ondansetron (IV), and 1 gram of tranexamic acid were administered to the patient during the procedure. The patient was given 10 IU of oxytocin and 0.2 mg methergine after the baby was delivered. With an APGAR score of 7-8-9, the baby was born healthy. Total blood loss and urine output during surgery are approximately 800 mL and 200 mL, respectively. The baby was then taken to the neonatal intensive care unit (NICU) to be quarantined and separated from the mother, who tested positive for COVID-19. The patient is transferred to a room with negative pressure.

The patient did not experience any difficulties after cesarean section, such as significant bleeding or postoperative neurologic abnormalities. The patient tested negative for COVID-19 and was symptom free on the seventh day after the cesarean section based on the results of the polymerase chain reaction (PCR) swab test and we sent her and the baby home.

DISCUSSION

Thrombocytopenia has been documented in approximately one-third of patients infected with COVID-19, increasing the risk of increased morbidity and mortality. Direct bone marrow suppression, cytokine storm-mediated platelet death, or platelet aggregation in the lungs are all causes of thrombocytopenia. Gestational thrombocytopenia (70-80%), hypertensive disorders of pregnancy (20%), and Immune Thrombocytopenic Purpura (ITP) (3-4%) are other major causes of thrombocytopenia in labor.² Preeclampsia, COVID-19 infection, or both could be the reason for thrombocytopenia in our case.

Because it can maintain respiratory function and dynamics in patients with respiratory distress, spinal anesthesia is the preferred type of anesthesia in women who have given birth with COVID-19. Aerosol-generating surgery, which is required in General Anesthesia (GA), is avoided with this anesthetic technique.¹ Furthermore, because of the danger of neuraxial hematoma, the safety of general anesthesia in the presence of thrombocytopenia is debatable. In COVID patients, it can be dangerous for encephalitis and meningitis from subarachnoid block. Although the cut-off the platelet count for a safe anesthetic effect is unknown, a platelet count of 70,000/mm³ in women who deliver is considered low risk.³

The Royal College of Obstetricians and Gynecologists (RCOG) and many studies consider a target platelet count of 50,000/mm³ for safe cesarean delivery and recommend transfusion of blood products including platelet concentrates before and/or immediately after delivery in preeclamptic patients.⁴ In some circumstances, these findings imply a safe lower limit for platelets. However, evidence of current prophylactic transfusion in the ICU with active bleeding for COVID-19 thrombocytopenia is lacking. In a COVID-positive pregnant woman with a platelet count of 24,000/mm³ who presented for emergency cesarean section, another case report using spinal anesthesia along with platelet infusion with satisfactory results.⁵

Our decision to use spinal anesthesia was based on new evidence of a safe outcome in delivery with a platelet count >50,000/mm³ and the need to avoid GA, which can exacerbate respiratory distress and increase the risk of viral transmission among healthcare workers. Thrombocytopenia is a sign of disease severity in COVID-infected individuals, and although the clinical manifestations of our patient were minor, mechanical ventilation prevented worsening of respiratory parameters.¹

COVID-19 patients must be kept away from transmitting the virus from the main door of the hospital. They should be transferred to a specially designated operating room with negative pressure ventilation.⁶⁻⁸ So far, there is no feasible drug or vaccine to be developed to combat COVID-19. Controlling future infections and the spread of the virus requires the use of protective equipment, hand hygiene, and personal isolation. It is essential to protect healthcare workers from exposure and to ensure a safe working environment. To reduce exposure and conserve valuable personal protective equipment, restrictions on movement in and out of working crew must be enforced before and during the procedure.¹

During operation, all staff must wear biosafety level 3 (BSL-3) protective clothing, which includes protective clothing, N95 masks, disposable caps, goggles and rubber gloves. Hospitals should conduct regular training on infection control techniques and be fully aware of nosocomial COVID-19 infections.⁶

To avoid cross-contamination, emergency cesarean section requires careful planning and preparation. Due to the nature of insufficient fasting in emergency department patients, special attention should be paid to the timing of fasting. Because nausea and vomiting have the potential to aerosolize and lead to transmission, postoperative nausea and vomiting prophylaxis should be given. Because regional anesthesia is safer than general anesthesia and avoids the use of artificial ventilation, it is recommended for COVID-19 patients.¹

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CONFLICT OF INTEREST

None

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Because of their aerosol-generating qualities, high-flow nasal passages should be used with care. Patients are provided with masks and negative pressure ventilation to reduce the spread of airborne germs, which has been shown to prevent cross-contamination during the SARS pandemic.³

After a cesarean section, transferring a COVID-19 patient to a post-anesthesia care facility can be dangerous and contaminate other postoperative patients. Suspected or confirmed patients should be observed in the operating room while undergoing cesarean section, and then taken to isolation after fully recovered.¹

Not all neonates born to women who are positive for COVID-19 need to be closely monitored. If the infant is stable and does not require care in the neonatal intensive care unit (NICU), the neonate should be isolated from other infants. Infants should be transferred from the operating complex to the NICU in a negative pressure incubator.⁹

CONCLUSION

Spinal anesthesia is safe to use in patient with platelet count >50,000/mm³ and to avoid general anesthesia to minimize transmission in patient with COVID-19. The safety of the anesthetic technique is highly dependent on the anesthesiologist and the patient's condition.