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# Successful Anesthetic Management in Cesarean Section for Pregnant Woman with COVID-19

## Authors' Contribution:

Study Design A  
Data Collection B  
Statistical Analysis C  
Data Interpretation D  
Manuscript Preparation E  
Literature Search F  
Funds Collection G

ABCDEF 1 **Diab A. Bani Hani**  
 ABCDEF 2 **Ibrahim Alsharaydeh**  
 ABCDEF 1 **Adel M. Bataineh**  
 ABCDEF 1 **Mahmoud Al Athamneh**  
 ABCDEF 1 **Ibrahim Qamileh**  
 ABCDEF 1 **Amin Al-Baik**  
 ABCDEF 3 **Majd H. Al Shalakhti**  
 ABCDEF 3 **Mohammad A. Al-Ebbini**  
 ABCDEF 3 **Abdelwahab J. Aleshawi**

1 Department of Anesthesia and Pain Medicine, Jordan University of Science and Technology, Irbid, Jordan

2 Department of Obstetrics and Gynecology, Jordan University of Science and Technology, Irbid, Jordan

3 King Abdullah University Hospital, Irbid, Jordan

**Corresponding Author:** Diab A. Bani Hani, e-mail: [dabanihani@just.edu.jo](mailto:dabanihani@just.edu.jo)**Conflict of interest:** None declared

**Patient:** Female, 29-year-old  
**Final Diagnosis:** COVID-19  
**Symptoms:** Pregnancy  
**Medication:** —  
**Clinical Procedure:** Cesarean section • spinal anesthesia  
**Specialty:** Anesthesiology

**Objective:** Unusual setting of medical care**Background:** The current COVID-19 pandemic highlights the importance of the mindful use of financial and human resources. Preventing infections and preserving resources and manpower are crucial in healthcare. It is important to ensure the ability of surgeons and specialized interventionalists to function through the pandemic. Until now, no justified protocol has been reported for the anesthetic management in cesarean section (CS).**Case Report:** A 29-year-old pregnant woman, G2P1 at 37+4 weeks of gestation, was referred to our center on March 28, 2020, after she had tested positive for COVID-19. She was stable and the CS was planned after she reached term. Through spinal anesthesia, CS was conducted. The anesthesia team was protected with full personal protection equipment. The operation was carried out smoothly without complication. A female neonate was delivered and was tested to be negative for COVID-19. No medical staff cross-infection was reported.**Conclusions:** Special precautions should be considered when pregnant women are undergoing CS. Spinal anesthesia is preferred over general anesthesia.**MeSH Keywords:** Anesthesia, Spinal • Cesarean Section • COVID-19**Full-text PDF:** <https://www.amjcaserep.com/abstract/index/idArt/925512>

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## Background

The available data on COVID-19 and pregnancy suggest that neither pregnancy nor delivery increase the chance of acquiring the virus, and there is no evidence of an association with a worse clinical picture compared with nonpregnant females of the same age group [1–3]. However, pregnant women who developed COVID-19-associated pneumonia have an increased risk for obstetric complications (e.g., preterm labor, premature rupture of membranes, preeclampsia, cesarean section [CS]) [1,4,5]. In addition, it is noteworthy that the increase in the body temperature associated with COVID-19 (i.e., hyperthermia) may lead to congenital anomalies if it occurs in the first trimester [6]. Although SARS-CoV-2 has not been detected in umbilical cord blood and evidence suggesting vertical transmission is not available, 3 cases have been reported in which neonates developed pneumonia despite strict infection control measures being implemented [1,7]. In addition, there is no verified protocol for the anesthetic aspect of providing care for pregnant women undergoing CS. In this article, we report a successful CS performed for a pregnant woman diagnosed with COVID-19 and we highlight the anesthetic aspects.

## Case Report

A 29-year-old woman, G2P1 at 37+4 weeks of gestation, was referred to King Abdullah University Hospital on March 28, 2020, after she had tested positive for COVID-19. At that time, she had a 4-day history of rhinorrhea without fever, chills, dry cough, or dyspnea. Regarding her obstetrical history, her previous delivery was by CS in 2017 due to fetal distress. Her last menstrual period was on September 7, 2019.

At admission, basic blood tests, electrocardiogram, and chest x-ray with abdominal shield were ordered. Elevated erythrocytes sedimentation rate and C-reactive protein were found, and the other investigations were unremarkable. The obstetrics team was consulted during the patient's hospital stay regarding her pregnancy and mode of delivery. There was good fetal movement. No watery leakage, abdominal pain, or vaginal bleeding was reported. The patient was counseled regarding her preferred mode of delivery, and she chose an elective CS over the vaginal birth after CS. Nasal swabs for COVID-19 were repeated on April 4, 2020, and on April 7, 2020, and both of them were positive.

On April 10, 2020, a CS under spinal anesthesia was done. Normal tubes and ovaries were found without adhesions. A female baby was delivered alive with a birth weight of 2.6 kg.

For the anesthetic procedure, the anesthesia team wore their operating room scrubs, then they headed toward the isolation

unit. They wore white gowns, N95 respirators, head caps, overshoes, and the face shields. They first wore a white gown, which covered the whole body apart from the head, hands, and feet; then the head cap, the overshoes, and 2 pairs of gloves (double gloving); and finally the N95 respirator and the face shield.

The technician had all the necessary equipment to perform both spinal and general anesthesia. The team headed entered the operating room, where the patient was lying on the operating table. In addition to N95 respirators, the team wore surgical masks on top, and a blue gown on top of the white one. They took a full history and an intravenous (IV) cannula was placed and IV fluids were given. The patient was put on full monitor, electrocardiogram, blood pressure, and pulse oximeter. After ruling out the use of anticoagulant, the team began spinal anesthesia.

The patient was put into the sitting position at the side of the table, and the procedure was started with sterile gloves being worn under aseptic technique. Painting was done and local anesthesia was given (3 mL of 2% lidocaine). A 25-gauge introducer of the spinal needle was then inserted, followed by the spinal needle. On the first attempt, bloody fluid came out, so the introducer along with the spinal needle was removed to prevent blood from obstructing the needle and causing failure of the spinal anesthesia. A new introducer was then inserted at the level of L4–L5, cerebrospinal fluid came out, and 2.5 mL of heavy bupivacaine 0.5% was given. The patient was kept in the sitting position for 30 s and then placed in supine position with her head raised. Her vitals were monitored and were stable without hypotension. Her O<sub>2</sub> saturation was 98%, her pulse was around 80, and her blood pressure was 125/56.

Subsequently, the obstetric team performed painting and full scrubbing. Spinal anesthesia was tested, and it was very effective. The obstetrician then started to perform CS. The blood pressure was stable during the course of the procedure, and there was no need to give ephedrine. After delivery of the baby, a specimen of the amniotic fluid was taken, and the baby was sent to the pediatrician, who performed the polymerase chain reaction COVID-19 swab. Estimated blood loss was less than 600 mL and 2.5 L of IV fluid was given during the whole procedure. The operation lasted around 30 minutes.

After skin closure, the patient was moved onto her bed and transferred to her isolation room, which was fully equipped as a recovery room. Before exiting the operation theatre, the anesthesia team removed their surgical mask, the first pair of gloves, and the blue gown. Then, they headed near the exit of the isolation unit to change their clothes. They started by removing the N95 respirator, then the other protective gear in sequence: the head cap, the overshoes, the white gown, and the second pair of gloves. After that, they took a shower bath and exited the isolation unit.

After the procedure, a nasal swab was done for the patient on April 12, 2020, and came back negative. The swab for the neonate was negative. Moreover, we did not report any cross-infection from the medical staff in contact with the patient.

## Discussion

Pregnant women with positive COVID-19 tests are managed according to the severity of illness. Mild cases need continuous fetal heart rate monitoring as well as maintaining oxygen saturation >95%, while more severe cases are managed by ICU teams. Avoiding the use of betamethasone (i.e., glucocorticoids) is advised because it may be associated with increased risk for mortality and delayed viral clearance (as is the case with influenza virus) [1].

The clinical severity of COVID-19 and gestational age are the main factors in determining the appropriate time for delivery. Pregnant women with mild illness whose pregnancy is still preterm can wait until their infection status is negative [8]. In mothers with severe illness, the risks and benefits should be weighed. If the pregnancy is past 32 weeks and delivery would help in improving a pregnant woman's respiratory condition, delivery is advised. However, if the gestation is premature or there is a risk of the respiratory condition worsening, then delivery can be delayed with constant fetal and maternal monitoring [1]. The Centers for Disease Control and Prevention (CDC) recommends that all patients should inform hospitals in advance about their COVID-19 status and hospitals should screen for COVID-19 signs and symptoms in patients with contact history with confirmed or suspected cases [9]. All health workers involved in the care of pregnant patients should wear surgical masks. Pregnant women with positive or suspected COVID-19 status should be cared for in negative pressure rooms before, during, and after delivery [1]. Patients with COVID-19 can be delivered according to individual obstetric indications, and the active infection alone is not a reason to perform CS [1,10]. Patients should be tested for COVID-19 if

they are symptomatic, and an evaluation of the maternal and fetal status should be performed in order to balance the risks and benefits of delaying the delivery (i.e., CS or induction of labor) until the result of the test comes back [1].

Use of neuraxial blockade techniques are advised during delivery of COVID-19 patients, whether by vaginal route or CS because these techniques will decrease the cardiopulmonary compromise caused by the stress of labor. Additionally, spinal anesthesia has advantages over general anesthesia for CS because it has lower rates of respiratory depression and it is not considered an aerosolizing procedure, so theoretically, it will decrease the need for personal protective equipment (i.e., decrease the chance of spread of the virus to health workers in the operating room) [1,11]. Patients undergoing CS under spinal anesthesia should wear a regional mask during the procedure. Also, sedative drugs should be avoided due to their respiratory depressive effects, but if used, they should be given gradually until the desired effect is reached. If needed, supplemental oxygen should be given at the lowest flow possible. Although there is no evidence to suggest that COVID-19 might spread to the cerebrospinal fluid, contact with the patient's fluid should be avoided as much as possible while performing the spinal blockade. Epidural blood patch and sphenopalatine block are not advised to be used in case the patient develops a dural puncture headache [11]. Postoperative patient-controlled analgesia is best avoided to prevent respiratory depression [1].

## Conclusions

Special precautions should be considered when providing care for pregnant women undergoing CS. Spinal anesthesia is preferred over general anesthesia.

## Conflict of interest

None.

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