



Impact of Coronavirus Disease Diagnosis on Maternal and Neonatal Health Outcomes in Pregnancy: Two Case Reports

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ABSTRACT

The new coronavirus, named severe acute respiratory syndrome coronavirus 2, is a major public health problem. When exposed to infection, alterations in the immune system, decreased respiratory capacity, and vascular and hemodynamic changes put pregnant women at high risk of complications. The fetus/newborn may be harmed. This study aimed to determine the maternal and neonatal outcomes of 2 pregnant women diagnosed with coronavirus disease 2019 (COVID-19). These 2 cases contribute to the growing evidence of the potential adverse maternal and neonatal outcomes of (COVID-19) infection during pregnancy.

Keywords: Coronavirus disease 2019, pregnant woman, neonates, preterm birth, preeclampsia

INTRODUCTION

The coronavirus disease 2019 (COVID-19), which is a deadly disease caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), spread rapidly and led to a worldwide public health crisis in 2019.¹ The coronavirus disease 2019 infection risks the health of pregnant women and their fetuses in the perinatal period.² For this reason, pregnant women are considered a sensitive population regarding the strategies developed for and the importance given to preventing infection during infectious diseases.³

Pregnant women infected with COVID-19 have an increased risk of pregnancy complications, such as preeclampsia, eclampsia, hemolysis, elevated liver enzymes, and low platelets (HELLP) syndrome, and referral to intensive care, compared to those not infected with COVID-19.⁴ Furthermore, when infected with COVID-19 in the perinatal period, problems such as fetal distress, premature birth, respiratory distress, and death occur.⁵ COVID-19 during pregnancy has also been associated with an increased likelihood of preterm birth.⁶

The risk of vertical transmission of COVID-19 infection during pregnancy is crucial for newborn health.⁷ There is no common consensus on the vertical transmission of COVID-19 from mother to fetus during pregnancy. Still, it has been reported that it is transmitted to the newborn by the aerosol route.⁸ Studies have not found any evidence of vertical transmission during the intrauterine period due to amniotic fluid and cord blood examination.^{5,9,10} No evidence of the presence of SARS-CoV-2 was found in the postpartum breast milk analysis.¹⁰ A study conducted in Turkey reported a SARS-CoV-2 infection in the placenta.¹¹

It is vital to prevent infection during pregnancy, control infected pregnant women according to current guidelines, and closely monitor newborns at risk of COVID-19.¹⁰⁻¹² In addition, individual health guidelines, effective medical care, and anti-infection practices designed for the protection of health can prevent adverse maternal and fetal outcomes at the global level.¹³

This study describes the maternal and neonatal outcomes of 2 pregnant women infected with COVID-19 pneumonia.

CASE PRESENTATIONS

Case 71

A 36-year-old woman (gravida 1, para 1), 34 weeks pregnant, was admitted to the hospital for routine control. The ultrasound screening revealed that the baby was in breech presentation and diagnosed with polyhydramnios as a result of the measurements. It was decided that hospitalization was



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necessary due to the contractions observed as a result of the nonstress test performed to evaluate the fetus's health. The SARS-CoV-2 test was positive according to the diagnosis based on reverse transcription-polymerase chain reaction (RT-PCR) from the nasopharyngeal swab routinely performed during hospitalization. The patient was observed in an isolated room and did not demonstrate any symptoms of COVID-19. The patient's respiratory rate was 22 breaths per minute, oxygen saturation was 98%, blood pressure was 100/70 mmHg, pulse was 80 beats/minute, and temperature was 36.6°C. In the 27th week of her pregnancy, her husband was diagnosed with COVID-19.

Prenatal Treatment

Enoxaparin sodium 0.4 2 × 1 was given intramuscularly (IM) in 2 doses every 24 hours, while 50 mg of ritonavir and 200 mg of lopinavir 2 × 2 25 mg were given orally. Laboratory blood analysis showed that C-reactive protein was 0.11 mg/L. All laboratory results were within the normal range. Three days after hospitalization (gestation week 34 + 4), the patient's contractions started. Due to breech presentation, delivery was performed by cesarean section.

Postpartum Treatment

The patient was given favipiravir 2 × 3 200 mg, metronidazole 2 × 500 mg IV, diclofenac sodium 2 × 1 (PRN) IM, and Enoxaparin sodium 1 × 1 0.4 IU SC. The patient was discharged from the hospital at her own request, rejecting the tests and treatments to be conducted 24 hours after the cesarean section. The risks of early postpartum discharge were explained. The vital signs of the mother were measured to be within the normal range.

Newborn

A baby boy with a birth weight of 2190 g, a birth length of 49 cm, and a head circumference of 33 cm was born. The Appearance, Pulse, Grimace, Activity and Respiration (APGAR) scores at 1 and 5 minutes were found to be 1 and 1, respectively. There was no respiratory effort and no signs of crying in the newborn. Muscle tone was hypertonic, and flexion was observed in the hip and knee joints. The newborn died shortly after birth.

CASE 2

A 30-year-old (gravida 1, para 1) 31+6 weeks pregnant woman was hospitalized due to high blood pressure. Ten days ago, she was diagnosed with COVID-19 at a hospital in the outer center. The pregnant woman did not have any symptoms of COVID-19. The patient's respiratory rate was 24/minute, oxygen saturation was 95%, blood pressure was 140/100 mmHg, pulse was 84 beats/minute, and fever was 36.5 °C. The patient stated that she had blurred vision. The RT-PCR test was performed during hospitalization, and the test result was negative. Six days after the pregnant woman was diagnosed with COVID-19, she applied to another state hospital due to a headache, and her blood pressure was recorded as 170/100. She was admitted to our hospital due to persistent high blood pressure. While she was 26 + 4 weeks pregnant, her husband was diagnosed with COVID-19.

As a result of the urinalysis performed in our hospital, protein ++ was found in the urine. Preeclampsia was diagnosed because the pregnant woman had signs and symptoms such as high blood pressure, blurred vision, and headache.

Prenatal Treatment

Acetylsalicylic acid 100 mg (1 × 1) was given orally, Betamethasone sodium phosphate and betamethasone acetate (1 × 24)

were administered in 2 doses with a 24-hour interval, and an oral treatment of methyldopa 3 × 1 was started.

Loading dose of magnesium sulfate (MgSO₄): It was administered by continuous intravenous infusion of 4 ampoules (6 g) of MgSO₄ in 100 mL of 0.9% isotonic sodium chloride in 15-20 minutes.

Magnesium sulfate maintenance therapy: 13 ampoules of 15% MgSO₄ were placed in 1000 mL of lactated Ringer's and administered by an infusion pump so that 1.8 g (1-3 g) of MgSO₄ in 100 mL of liquid would be given per hour.

On the second day of hospitalization (32+1 weeks), 4 ampoules (1 ampoule of 840 mg) of sodium bicarbonate placed in 500 mL of 0.9% isotonic sodium chloride were given as 20 cc/h IV due to Na:120 mEq/L revealed in the blood analysis. Since Na: 118 mEq/L was found in the blood analysis performed for control purposes, sodium chloride treatment was repeated. In the second control analysis, it was seen that Na was 120 mEq/L. It was concluded that an electrolyte imbalance was initiated due to the decrease in Na. Hematuria was detected, and the total protein in urine was 5.78 g, while hemoglobin was 14.4 g/dL, thrombocytopenia 10 000/mm³, uric acid 7.4 g/dL, and blood pressure was 140/100 mgHg. There was also increased electrolyte imbalance and edema in the legs and vulva. A diagnosis of severe preeclampsia was made, and a cesarean section was planned. After cesarean delivery, the patient was followed up in the intensive care unit, and intubation was not required. Our case was followed up in the intensive care unit for 4 days and discharged from the hospital after being followed up in normal patient service for 2 days.

Postpartum Treatment

She received methyldopa (2 × 1) 250 mg, nifedipine (2 × 1) 60 mg=orally, and cefuroxime axetil (2 × 1) 500 mg orally while enoxaparin sodium (1 × 1) was given through subcutaneous injection. Maintenance treatment was continued for 24 hours after delivery. Our case was followed up in the intensive care unit for 4 days, followed up in the normal patient service for 2 days, and then discharged.

Newborn

A baby girl with a birth weight of 1250 grams, a birth length of 39 cm, and a head circumference of 28 cm was born. The APGAR scores at 1 and 5 minutes were found to be 5 and 8, respectively. The baby was transferred to the neonatal intensive care unit due to premature birth and respiratory distress. The RT-PCR test was not performed on the newborn since the RT-PCR test performed during the mother's hospitalization was negative. No signs of respiratory distress were observed in the newborn on the second postnatal day. The baby continued to be followed up in the neonatal intensive care unit due to its premature birth. She was fed with breast milk (1 mL) for a week from the second day after delivery. The baby, weighing 2065 grams on the 34th day after birth, was discharged from the hospital. She is fed with 60 mL of milk on the 44th day after birth, and there is no problem with her health status. Postpartum 45. Rop examination and eye test screening results were found to be normal.

DISCUSSION

This study presents 2 cases of pregnant women who underwent emergency cesarean sections at 34+4 weeks and 32+1 weeks gestation. Both pregnant women and their spouses were diagnosed with COVID-19.

Pregnant women infected with COVID-19 during pregnancy are at high risk for complications of premature birth or stillbirth.¹⁴ In a multinational cohort study, when pregnant women with and without a diagnosis of COVID-19 were compared, COVID-19 in pregnancy was associated with increases in severe maternal morbidity, mortality, and neonatal complications.⁴ It was found that, of the pregnant women infected with COVID-19, 35.0% experienced preterm birth, while 30.5% experienced low birth weight.³ A multicenter study conducted in Turkey reported that the prevalence of preterm birth was 26.4% and low birth weight was 12.8%.¹⁵ A study in England reported that the number of stillbirths increased during the pandemic compared to the prepandemic period.¹⁶ In our study, the postpartum death of case 1's baby was consistent with the study's findings. Our study includes the results of 2 women and their babies infected with COVID-19. Although both women had tested positive for COVID-19, the reason for their preterm births could not be determined. Case 1's baby died postpartum, while case 2's baby was discharged from the hospital in good health. Since no tests were conducted on the babies, the cause of the baby's death in case 1 could not be determined.

Preeclampsia is a disease characterized by proteinuria and high blood pressure after 20 weeks of gestation and is the cause of maternal and perinatal morbidity and mortality.¹⁷ Risk factors for preeclampsia include primigravida, prepregnancy weight, age, history of preeclampsia, and lifestyle changes.¹⁸ Severe acute respiratory syndrome coronavirus 2 may contribute to the development of preeclampsia by causing hypoxic injury.¹⁹ In a study conducted with 23 pregnant women in England, preeclampsia occurred in 10.5% of the patients in the third trimester, with one developing liver dysfunction, HELLP, and Disseminated Intravascular Coagulation (DIC).²⁰ In a meta-analysis study, a significant difference was not found in preeclampsia risk between infected and uninfected women.²¹ During pregnancy, COVID-19 is associated with preeclampsia, especially in nulliparous women.²² Our findings are similar regarding the second case in our study, who was also nulliparous and was diagnosed with preeclampsia.

A case-control study reported that SARS-CoV-2 infection had little effect on neonatal outcomes.²³ In another study, receipt of breast milk at discharge was lower in neonates whose mothers were SARS-CoV-2 positive within the 10 days before birth.²⁴ Yet, another study found no evidence of vertical transmission in newborns of mothers positive for or with suspected SARS-CoV-2 infection.²⁵ Regarding the second case in our study, the baby was fed with breast milk on the second day after birth, and the process continued with no interruption. No symptoms of COVID-19 were observed in the newborn.

The role of COVID-19 in causing preterm birth remains inconclusive. The current study presents 2 case reports. The research results cannot be generalized to the population but provide important findings for future studies.

CONCLUSION

Our study presented the evaluation of 2 cases regarding maternal and neonatal outcomes and the associated risk factors. There is a need to provide the vulnerable population of pregnant women with evidence-based guidelines and information to manage their health and protect themselves against risks.

Informed Consent: Written informed consent was obtained from the two pregnant women who participated in this study.

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