

Received: 2020.04.28

Accepted: 2020.06.16

Available online: 2020.06.23

Published: 2020.07.27

Successful Maternal and Fetal Outcomes in COVID-19 Pregnant Women: An Institutional Approach

Authors' Contribution:

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

ABEF 1 **Steven Douedi**
BE 1 **Asseel Albayati**
BE 1 **Nasam Alfraji**
ABE 2 **Usman Mazahir**
AF 2 **Eric Costanzo**

1 Department of Internal Medicine, Jersey Shore University Medical Center, Neptune, NJ, U.S.A.
2 Department of Pulmonology and Critical Care, Jersey Shore University Medical Center, Neptune, NJ, U.S.A.

Corresponding Author: Steven Douedi, e-mail: Steven.Douedi@hackensackmeridian.org

Conflict of interest: None declared

Case series

Patients: Female, 26-year-old • Female, 27-year-old • Female, 19-year-old
Final Diagnosis: Acute Respiratory Distress Syndrome (ARDS) • COVID-19
Symptoms: Fever • hypoxia • shortness of breath
Medication: —
Clinical Procedure: Cesarean section • mechanical ventilation
Specialty: Critical Care Medicine • Infectious Diseases • Medicine, General and Internal • Obstetrics and Gynecology

Objective: Management of emergency care





Background: Novel Coronavirus 2019 (COVID-19) has been defined as a pandemic infecting millions of individuals with a significantly high mortality and morbidity rate. Treatment and management for pregnant patients infected with COVID-19 has been poorly described in the literature. Furthermore, vertical transmission of COVID-19 to the fetus has been poorly described. The purpose of this case series is to present 3 patients in their trimester who underwent emergent cesarean sections and were successfully managed in the intensive care unit.

Case Reports: We present the cases of 3 patients diagnosed with COVID-19 via RT-PCR in their third trimester of pregnancy. All patients underwent emergent cesarean sections and were managed on mechanical ventilation in the intensive care unit and eventually discharged in stable condition.

Conclusions: Early cesarean section and aggressive management with mechanical ventilation has been shown to be very beneficial for mothers diagnosed with COVID-19 and their infants. All 3 patients were successfully extubated, and all 3 infants tested negative for COVID-19, suggesting no vertical transmission; although, further studies are needed to confirm this finding.

MeSH Keywords: Cesarean Section • Coronavirus • COVID-19 • Disease Transmission, Infectious • Pregnancy

Full-text PDF: <https://www.amjcaserep.com/abstract/index/idArt/925513>

 1064  —  —  4



Background

Novel Coronavirus 2019 (COVID-19) is known to cause symptoms ranging from common cold symptoms to severe pneumonia and even death [1]. While this illness has gained a spotlight in the media and the medical world since its outbreak in December 2019, scarce studies have focused on the vertical transmission and disease severity in pregnant women with COVID-19 [2]. We present 3 cases of women in their third trimester with COVID-19 requiring cesarean sections and intensive care management.

Case Reports

Patient 1 was a 26-year-old woman, G2P0010 at 28 weeks gestation, who presented with fever, chills, dyspnea, and cough. She had regular prenatal care and denied any travel history, sick contacts, or obstetric complications. In the emergency room, she had a temperature of 38.4°C, heart rate of 123 beats per min, blood pressure of 122/67 mmHg, respiratory rate of 30 breaths per min, and oxygen saturation of 90% on room air. Her chest x-ray was significant for left upper lobe and right lower lobe infiltrates. Laboratory results were significant for anemia (hemoglobin 10.4; reference range 12.0–16.0 g/dL), thrombocytopenia (platelet count 115; reference range 140–450 10^3 /uL), lymphopenia (11.3%, reference range 25–43%), and neutrophilia (30.4%, reference range 50–70%). Results of blood cultures, Legionella and Streptococcus urine antigen, influenza A and B, respiratory syncytial virus, and an extended respiratory pathogen panel polymerase chain reaction (PCR) test were unremarkable; however, her COVID-19 RT-PCR returned positive. Nonstress and doppler testing confirmed a normal, viable pregnancy. The patient became increasingly hypoxic requiring 100% oxygen via nasal high flow. She was admitted to the Intensive Care Unit (ICU) and intubated on hospital day 3 for respiratory failure. She was given 2 doses of betamethasone to aid in fetal lung maturity prior to undergoing an emergent cesarean section delivery of a baby boy, who had Apgar scores of 1 at 1 min and 7 at 5 min. She received a dose of intravenous tocilizumab (400 mg). The patient's respiratory status improved, and she was successfully extubated to a nasal cannula on hospitalization day 5, after 2 days of mechanical ventilation. Supplemental oxygen was titrated down, and she was eventually cleared for discharge on hospitalization day 9. The patient's baby was ultimately intubated in the neonatal intensive care unit (NICU). The baby tested negative for COVID-19 on days of life 3 and 7 and remained asymptomatic during hospitalization. He continued to clinically improve and was extubated on day 11 and weaned off supplemental oxygen by day 13, ultimately being discharged.

The other 2 patients had a similar hospital course and tested positive for COVID-19 via RT-PCR. Patient 2 was a 27-year-old woman G3P2A0 (2 cesarean sections) at 30 weeks gestation. Patient 3 was a 19-year-old woman G1P0 at week 31 gestation. Both patients had received routine prenatal care and presented with chest pain, shortness of breath, non-productive cough, fever, chills, nausea, and non-bloody vomiting.

Patient 2's admission vitals were blood pressure of 125/57 mmHg, heart rate of 100 beats per min, respiratory rate of 20 breaths per min, temperature of 37.1°C, and oxygen saturation of 87% on room air. She was placed on 100% oxygen via Optiflow 50 liters, where she was saturating >95%, and was transferred to the ICU for closer monitoring. The nonstress test performed on admission was unremarkable with a fetal heart rate in the 130s, and moderate variability with accelerations, no decelerations. She was started on daily hydroxychloroquine 400 mg and azithromycin 500 mg, vitamin C 1 g every 8 h, zinc sulfate 400 mg twice daily, and remdesivir for 10 days. Two doses of 12 mg of betamethasone for fetal lung maturity were also given. Due to progressive increase in the work of breathing and requirement of oxygenation, the patient was urgently intubated on day 2 and delivered by cesarean section. The operation was uncomplicated and delivered a male infant who was intubated and taken to the NICU for 5 days. The infant remained COVID-19 negative during his hospital course. The patient was successfully extubated on day 8 to a high-flow nasal cannula at 15 liters per min and by day 13 was weaned off supplemental oxygen and discharged.

Patient 3's admission vitals were heart rate of 84 beats per min, blood pressure of 149/100 mmHg, respiratory rate of 18 breaths per min, temperature of 36.7°C, and oxygen saturation of 99% on room air. Chest x-ray and lab results were unremarkable, but random urine protein was positive. Nonstress and doppler testing confirmed a normal, viable pregnancy. On hospitalization day 6, she received 2 doses of 12 mg betamethasone for fetal lung maturity and magnesium for seizure prophylaxis. She was found to have transaminitis, elevated creatinine, and thrombocytopenia. She was diagnosed with HELLP syndrome and subsequently underwent an emergent cesarean section, receiving 2 units of platelets intraoperatively. She was ultimately intubated in the operating room due to respiratory distress but was successfully extubated later that day. A female infant was delivered with Apgar scores of 3 at 1 min and 7 at 5 min, weighing 1310 g. After 2 days in the NICU, her respiratory status responded to diuretics, and supplemental oxygen was weaned down to room air by day 8. The patient was discharged home on hospitalization day 9 with her baby who tested negative for COVID-19.

Discussion

These cases describe successful cesarean deliveries of babies in pregnant patients suffering from severe COVID-19 infection and requiring mechanical ventilation and ICU care. There is scarcity of information regarding the assessment and management of pregnant women infected with COVID-19, and the potential risk of vertical transmission is unclear. Chen et al. and Zhu et al. have also reported 18 deliveries, the majority via caesarian section, which resulted in no vertical transmission of COVID-19 [3,4]. Our patients' infants tested negative for COVID-19 after delivery and remained asymptomatic during hospitalization, consistent with the current literature. Multidisciplinary management of these patients is of the utmost importance, and the need for larger studies is warranted to develop treatment algorithms for this patient population.

References:

1. He F, Deng Y, Li W: Coronavirus disease 2019: What we know? *J Med Virol*, 2020; 92(7): 719–25
2. Rasmussen SA, Smulian JC, Lednicky JA et al: Coronavirus Disease 2019 (COVID-19) and pregnancy: What obstetricians need to know. *Am J Obstet Gynecol* 2020; 222(5): 415–26
3. Chen H, Guo J, Wang C et al: Clinical characteristics and intrauterine vertical transmission potential of COVID-19 infection in nine pregnant women: A retrospective review of medical records. *Lancet*, 2020; 395(10226): 809–15
4. Zhu H, Wang L, Fang C et al: Clinical analysis of 10 neonates born to mothers with 2019-nCoV pneumonia. *Transl Pediatr*, 2020; 9(1): 51–60

Conclusions

COVID-19 infection management in pregnant patients has been poorly defined and explained in the literature. Early intubation and cesarean delivery of the babies prior to decompensation may have been the reasons behind the overall positive outcome in our cases. Furthermore, all 3 infants tested negative for COVID-19, suggesting no vertical transmission in our patients; although, further studies are needed in this patient population.

Conflict of interest

None.