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Emergency Cesarean Section at 38 Weeks of Gestation with COVID-19 Pneumonia: A Case Report

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

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Conflict of interest: None declared

Patient: Female, 30-year-old
Final Diagnosis: COVID-19
Symptoms: Chills • cough • diarrhea • fatigue • fever • headache • myalgia • nausea • rhinorrea • shortness of breath • vomiting
Medication: —
Clinical Procedure: Cesarean section
Specialty: Critical Care Medicine • Obstetrics and Gynecology • Surgery

Objective: Rare disease

Background: Up to 47% of pregnant women with COVID-19 have preterm deliveries. A severe, symptomatic COVID-19 infection in close-to-term pregnancies can have a poor prognosis. Early identification of COVID-19 in pregnant women can prevent the progression of the disease. Currently, there is very little guidance on treating pregnant close-to-term women with COVID-19; this case report suggests changes to current management to maximize positive maternal and fetal outcomes.

Case Report: A pregnant woman (37 weeks of gestation) presented to the Emergency Department with a chief complaint of fever with an associated cough for 2 days. She was diagnosed with COVID-19 in the Emergency Department, and discharged in a stable condition. She returned 5 days later in preterm labor with severe respiratory distress. After an emergency cesarean section, she remained intubated in the Surgical Intensive Care Unit; she was persistently hypotensive and hypoxic despite maximal ventilator and medical treatment. She died after a cardiac arrest and unsuccessful resuscitation, 15 days after the delivery. We discuss the possible benefit of a planned C-section for close-to-term pregnancies prior to the onset of COVID-19 symptoms. The patient's next of kin gave informed consent for this case report. Approval from the Institutional Review Board or Ethics Review Board was not required as this is a case report.

Conclusions: Currently, asymptomatic pregnant women are not tested for COVID-19 infection until hospitalization for delivery. It could be beneficial to have a protocol in place to screen asymptomatic pregnant women so they can be identified early and monitored, as COVID-19 symptoms can escalate quickly.

MeSH Keywords: Cesarean Section • COVID-19 • Pregnancy Complications, Infectious • Pregnancy, High-Risk

Full-text PDF: https://www.amjcaserep.com/abstract/index/idArt/926591

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Background

The symptoms of the coronavirus disease 2019 (COVID-19) infection can range from mild symptoms including fever, cough, sore throat, myalgia, and malaise to severe illness requiring immediate advanced critical-care support, including pneumonia with or without acute respiratory distress syndrome, renal failure, and multiorgan dysfunction. In pregnant women, the clinical presentations can be atypical with normal body temperatures and normal white blood cell counts [1]. A positive COVID-19 result does not assure maternal or fetal compromise, or an indication for expedited birth.

The adverse effects of severe acute respiratory syndrome (SARS) and the Middle East respiratory syndrome (MERS) on pregnant women include preterm deliveries, stillbirths, and respiratory complications. Respiratory complications can occur because a gravid uterus can cause basal atelectasis, reduced functional residual capacity, and increased oxygen consumption. In pregnant women, this can result in poorer outcomes during respiratory illnesses. Studies have shown that pregnant women can be more susceptible to viral illnesses, and these illnesses can lead to consequences including abortion, spontaneous early delivery, and an increased incidence of stillbirth [1]. The current COVID-19 virus is about 85% similar to the SARS and MERS coronaviruses [2]. However, the COVID-19 virus appears to be less lethal in comparison with SARS and MERS [3].

A real-time polymerase chain reaction (RT-PCR) test from nasal and throat swabs, sputum, and feces is used to diagnose COVID-19. The virus has not been detected in samples from vaginal swabs, amniotic fluid, placenta, cord blood, neonatal blood, and breast milk. This suggests that the risk of vertical transmission from the mother to the baby is unlikely. There have been no previous cases of vertical transmission during the SARS or MERS pandemics [4].

The management of COVID-19 in pregnancy includes early isolation, aggressive infection-control procedures, laboratory testing for the virus and co-infections, along with the prevention of fluid overload, fetal monitoring, monitoring uterine contractions, oxygen therapy when necessary, and early mechanical ventilation for progressive respiratory failure. Individualized delivery planning and having a multispecialty management approach can be beneficial [5]. The National Health Commission of China has proposed strengthening health counseling, screening, and follow-ups for pregnant women. They have recommended a designated isolation unit for at least 14 days after the birth and avoiding close contact between the neonate and the mother while she has a suspected or confirmed COVID-19 infection [6]. Conversely, the United Kingdom suggests keeping the mother and neonate together in the immediate postpartum period unless critical care is necessary for the mother or neonatal care is necessary for the infant. The UK also promotes breastfeeding, even if the mother is diagnosed with COVID-19 [7]. Guidelines from other countries have not yet been published.

Despite the fact that COVID-19 is less lethal than SARS and MERS, the COVID-19 infection can result in severe symptoms in pregnant women. Therefore, they should be identified early and efforts should be made to prevent the progression of the disease, especially since women with severe COVID-19 infection at the time of giving birth have required ventilation and extracorporeal membrane oxygenation (ECMO). Currently, there is very little guidance on the management of close-to-term pregnant women with COVID-19, to maximize positive maternal and fetal outcomes. In the light of previous cases of preterm labor induced by COVID-19, it is unclear whether scheduling a cesarean section prior to the onset of COVID-19 symptoms can decrease maternal and fetal mortality.

Case Report

A 30-year-old woman, who was gravida 4, para 2 (1 term birth, 1 premature birth, 1 abortion) with an intrauterine pregnancy of 37 weeks and 5 days presented to the Emergency Department with a chief complaint of fever and an associated cough for 2 days. Her medical history was a previous cesarean section (C-section), endometriosis status after excision of the anterior abdominal wall endometrioma, and atypical squamous cells of undetermined significance. She denied smoking, alcohol use, and recreational drug use. She reported decreased fetal movements for the past day. She denied contractions, loss of fluid, and vaginal bleeding. She reported remission of the fever with 650 mg of acetaminophen. As these findings were consistent with a COVID-19 infection, an obstetrician-gynecologist (OB/GYN) assessed her and determined that the patient and pregnancy were stable for discharge. She was swabbed for RT-PCR testing with a nasopharyngeal swab using the Becton Dickinson (BD) BioGX SARS-CoV-2 reagents for the BD Max™ System (Becton, Dickinson and Company, Franklin Lakes, New Jersey, USA) [8]. She was then started on azithromycin (Zithromax, Pfizer, New York City, USA) with an initial 500 mg PO (per os) on day 1, and subsequent 250 mg PO daily for the next 4 days for possible community-acquired pneumonia. She was discharged with instructions to follow-up with her primary-care physician and OB/GYN.

She returned 5 days later in preterm labor and respiratory distress. Her X-ray on admission showed bilateral infiltrates (Figure 1). Initially, she had an oxygen saturation of 75% on room air; however, her oxygen saturation further deteriorated to 60% on room air. A nonrebreather mask was used while she was rushed to the operating room for an emergency C-section. In the operating room, she was intubated and a viable female infant was delivered from a vertex presentation.

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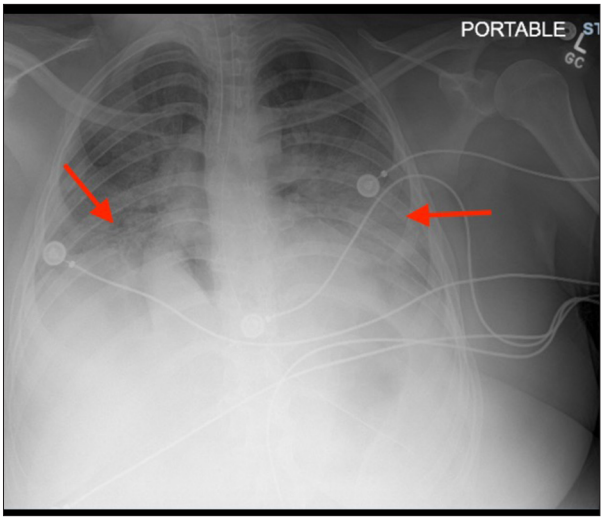

Figure 1. Chest X-ray on admission shows diffuse bilateral infiltrates (arrows).

Postoperatively, she remained intubated and was transferred to the Surgical Intensive Care Unit (SICU). On postoperative day 2, she developed a fever from an unknown source. She was not febrile when she presented to the hospital in preterm labor or on postoperative day 1. Blood and sputum cultures were drawn and she was started on intravenous (IV) piperacillin-tazobactam (Zosyn, Pfizer, New York City, USA) 3.387 mg/8 h and vancomycin 500 mg IV/6 h. The bedside cardiac and inferior vena cava (IVC) ultrasound showed good contractility, a normal appearance of the right atrium and ventricle, and a dilated, non-collapsing IVC, indicating an euvolemic state. Throughout the course of her SICU stay, she displayed no significant neurologic improvement and developed worsening tachycardia, hypertension, and ventilator dyssynchrony. She required maximum ventilatory support with 100% fractional inspiration of oxygen (FiO2) and a positive end-expiratory pressure (PEEP) of 20 cm$H_2$0 to maintain hemoglobin-oxygen saturations above 90%. A chest tube was placed on the right side due to barotrauma as she required a high PEEP to maintain oxygenation. Her D-dimer levels rose to 9.56 mcg/ml fibrinogen equivalent units; therefore, a heparin drip was added for therapeutic anticoagulation. She was registered for a Mayo Clinic convalescent plasma trial and received 1 dose of 200 ml convalescent plasma. The repeated intervals of pronation initially improved her respiratory status; however, her condition worsened on day 15 after intubation, with the chest X-ray showing worsening confluent opacities (Figure 2). She desaturated to 80% to 86% during a pronation attempt. In addition, she was persistently hypotensive and hypoxic without improvement, despite maximal ventilation and medical treatment. A cardiac arrest ensued 15 days after the delivery and admission to the SICU, and resuscitation was unsuccessful.

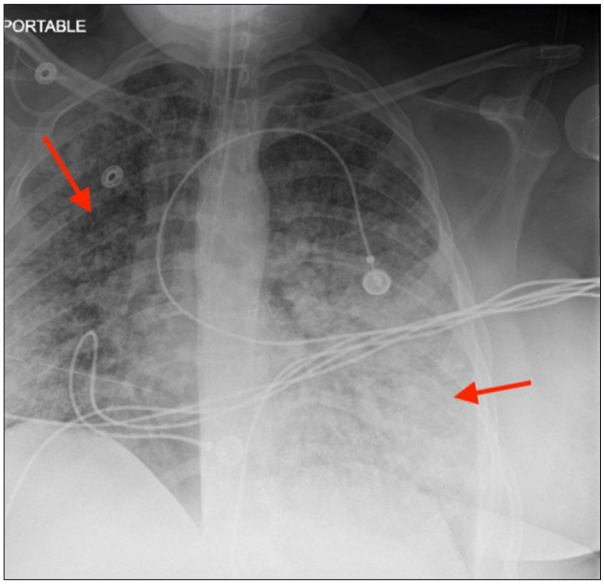

Figure 2. Chest X-ray on postoperative day 15 shows a worsening course with increased confluent opacities (arrows).

Informed consent was obtained from her next of kin. As this is a case report, approval from the Institutional Review Board or Ethics Review Board was not necessary.

Discussion

Current data suggest that pregnant women are no more likely to contract COVID-19 than the general population. While pregnant women are not necessarily more susceptible to a viral illness, pregnancy can result in immune system changes resulting in an increased severity of the symptoms. Since COVID-19 infection can result in severe symptoms in pregnant women, they should be identified early and all efforts should be made to prevent the progression of the disease, especially since there have been case reports similar to the present case, where the women with severe COVID-19 infection at the time of giving birth have required ventilation and ECMO [6].

A recent study of pregnant women affected by COVID-19 to date suggests that women who gave birth did so within 13 days of the onset of the illness [3]. Thirteen pregnant women aged between 22 years and 36 years were diagnosed with COVID-19 and admitted to the hospital. Eleven women were in their 3rd trimester with no underlying medical conditions. Ten out of 13 patients (77%) presented with fever, and 3/13 (23%) patients complained of dyspnea. Only 3/13 patients (23%) improved after hospitalization and were discharged with an uncomplicated ongoing pregnancy. Ten women (77%) underwent C-sections; 5/10 (50%) delivered emergently because of pregnancy complications, including fetal distress and premature rupture of the

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membranes. One patient had a stillbirth. Six patients (46%) had preterm labor between 32 weeks and 36 weeks of gestation [9]. Two patients were admitted to the Intensive Care Unit (ICU), 1 developed multiorgan dysfunction and had to be placed on the ECMO [9]. The woman in the present study (38 weeks of gestation) presented with dyspnea and required intubation and an emergent C-section. She did not have any significant comorbidities. Recent evidence suggests that while the current COVID-19 virus is less lethal than the SARS or MERS virus, 47% of women affected by COVID-19 delivered preterm. This is significantly greater than the reported 4/16 (25%) pregnant women with SARS who had preterm deliveries, and the 3/11 (27%) pregnant women with MERS who delivered preterm by C-section [3].

Pregnant women affected by SARS and MERS had a higher case-fatality rate compared to non-pregnant women. The case-fatality rate was 15% for all reported pregnancy cases of SARS, with an ICU admission rate of 60%. In pregnant women affected by MERS, the case-fatality rate was 27% while the ICU admission rate was 64% [3]. The case-fatality rate and ICU admission rate of pregnant women affected by COVID-19 is yet to be determined.

The risk to pregnant women with coronavirus infections (SARS, MERS) appears to increase particularly during the last trimester of pregnancy. Pregnancy is known to be a hypercoagulable state. Emerging evidence suggests that patients hospitalized with COVID-19 are also hypercoagulable, suggesting that a COVID-19 infection during pregnancy can result in an increased risk of maternal venous thromboembolism [7]. In addition, although viral infections during pregnancy can be asymptomatic, approximately half of all preterm deliveries are associated with histologic evidence of chorioamnionitis, which could be due to a viral infection [10].

Studies comparing the frequency of adverse maternal outcomes between preterm emergency cesarean deliveries and term emergency cesarean deliveries in patients unaffected by COVID-19 show that the preterm cesarean deliveries have significantly higher rates of abnormal bleeding, which can require transfusion, and the use of antibiotics, compared to term cesarean deliveries. In addition, a classic abdominal incision for C-sections was related to an increased rate of blood transfusion and the need for antibiotic treatment [11]. Elective C-section prior to the progression of normal labor has risks, including infection, thromboembolism, postpartum hemorrhage, surgical injury to the mother or neonate, and neonatal transient tachypnea.

Conclusions

Currently, we do not test asymptomatic pregnant women (for isolation purposes) for COVID-19 until they are admitted to the hospital in labor. It would be beneficial to have a protocol in place to screen asymptomatic pregnant women so they can be identified early and monitored, as COVID-19 symptoms can escalate quickly. It could be beneficial to induce labor or perform a C-section early if pregnancies are close to term (at the discretion of the OB/GYN and the patient) to prevent the onset of severe symptoms and labor simultaneously, as this can affect maternal and fetal outcomes.

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Conflicts of interest

None.

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