

# Possible vertical transmission and pregnancy complications during pregnancy due to COVID-19

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## ABSTRACT

The World Health Organization warned that the 2019 novel coronavirus disease (COVID-19) outbreak could be considered a “pandemic.” The pandemic has put uncovered vulnerable populations across international health crises. The author presented a case report of a young woman, pregnant in the third trimester, diagnosed with COVID-19, and presented with PROM. A 19-year-old woman presented with a 4-day history of low-grade fever. She was diagnosed with premature rupture of membranes and vaginal bleeding, and suspicion of COVID-19. PROM test was positive. The main procedure was emergency C-section delivery in the next 24 hours. The neonatal isolation was implemented immediately after birth, without delayed cord clamping or skin-to-skin contact. The neonatal nasopharyngeal swab after delivery was Coronavirus (COVID-19) positive. A severe case of maternal and neonatal COVID-19 during the third trimester of pregnancy led to premature rupture of membranes and vaginal bleeding, and preterm delivery. A multidisciplinary team for treating and managing severe COVID-19 during pregnancy is critical for positive patient outcomes.

**Keywords:** Vertical transmission, Pregnancy complications, COVID-19 pandemic, Preterm, PROM

## Introduction

The World Health Organization announced that the outbreak of (COVID-19) can be considered a “pandemic” where the virus spreads progressively around the world. Thirty-nine million people and more suffered from the virus worldwide till Oct 16, 2020, with a death toll exceeding 1,099,000 [1-5].

The severe acute respiratory syndrome coronavirus-19 pandemic has uncovered vulnerable populations across international health crises [1, 2, 6-8]. The knowledge obtained from prior human coronavirus epidemics revealed that pregnant women and neonates are from the most vulnerable populations and at high risk of COVID-19 infection, according to their body immunity and are mainly at risk for bad findings [8-11]. Several case reports

about pregnancy during covid-19 showed different results and effects on mothers and babies [1, 7, 8]. This doubt affected obstetricians to depend on certain procedures such as cesarean birth, mother-baby isolation, and formula or expressed milk feeding [1, 11]. The clinical decisions that can be taken will be better and based on solid knowledge after reviewing and evaluating the outcomes stated by databases and registry studies. [1]. Obstetricians are still learning about COVID-19 and how it appears and evolves in pregnancy, where most cases have a good outcome [1, 2, 7, 8]. In a recent systematic study [9], almost 3% of pregnancies showed severe maternal morbidity. They reported that severe outcomes are more likely to present in mothers with a complicated medical history. The experts recommended building the management of COVID-19 in pregnancy based on the results showed from the current epidemic, which focuses on the complex clinical management of COVID-19 cases [1, 7, 8, 12].

Several studies have stated that respiratory complications, mothers’ situation collapse, or dead fetuses induce delivery immediately among pregnant women infected by other viruses [1, 8, 13, 14]. However, there is not enough evidence that

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inducing immediate delivery will decrease the adverse outcomes among COVID-19 pregnant women.

The author presented a case report of a young woman in her third trimester of pregnancy, diagnosed with COVID-19, who came with PROM.

### Case presentation

A 19-year-old mother came to the hospital Emergency Department suffering from a 4-day history of low-grade fever, pregnant at 33 + 1 week of gestation, Gravida 3, and Para 2. She was diagnosed with premature rupture of membranes and vaginal bleeding, and suspicion of COVID-19. She had a history of regular deliveries.

Her vital signs were; Temp: 37,5 and RR:122/57 mmHg. The blood group was A+. The Transabdominal ultrasound showed the following; Placenta: side of the uterus. Fetal position: cephalic presentation. Amniotic fluid: AFI 8,5 cm. Doppler: normal. While the speculum showed dark blood with clots PROM test was positive. The main procedure was emergency c-section delivery in the next 24 hours. And the treatment plan includes the following medications: RDS Prophylaxis (Celestan), Tocolysis with Nifedipine Ampicillin 2g i.v 1-1-1, Azithromycin single shot 1,5g.

A female baby was delivered with a birth weight of 1825 g and a birth length of 42 cm. Direct implementation of neonatal isolation was done, without being implemented immediately, without any chance of skin-to-skin contact. At 1-minute, 5 minutes, and 10 minutes the Apgar Scores were: 07/10/10. The neonatal nasopharyngeal swab after delivery was positive for Coronavirus (COVID-19).

### Results and Discussion

The COVID-19 infection became a global pandemic on Mar 11, 2020, based on the WHO [15, 16]. Several studies were conducted on covid-19 pneumonia patients regarding CT, clinical signs, diagnosis, and treatment. A few of these studies focused on pregnant women with COVID-19 pneumonia [17]. In order to have critical and strong guidelines, studies need to determine the clinical features and outcomes of COVID-19 pregnant cases. The studies and the guideline must focus on; how to prevent, treat, and manage [18].

The author presented a case of an emergency cesarean section and preterm delivery, and she suffered from acute COVID-19 during her last trimester of pregnancy; her gestational age was 33 weeks + 1. The case provided more evidence and information to the existing evidence, which increased worries about the potential adverse outcomes of COVID-19 infection during pregnancy [9, 19-22]. In the majority of cases, mothers with COVID-19 infection have mild symptoms and solve without treatment. However, in some reported cases, there was a necessity to admit mothers to intensive care admission, and one case required invasive ventilation with extracorporeal membrane oxygenation [22]. Zaigham and Andersson suggested that

pregnancy-stimulated immune reactions and changes in cardiovascular can amplify the COVID-19 infection [9]. Mothers with complicated past medical histories are at huge risk for poor findings.

Regarding the worries of transferring the infection to the neonate, even though the first reported cases of COVID-19 in newborns referred to the possible risk of transmission [23], there was no clue of COVID-19 transmission from the mother to baby [24, 25]. There is a need for more systematic studies about the ability of vertical transmission to provide more robust evidence [26].

In the current case, the researcher presented a third-trimester pregnant woman diagnosed with COVID-19. The first studies confirmed the rapid increase of antibody levels during the first two weeks of the infection [6, 27-29]. After revising the disease course, the author assumed that the mother was infected prior to delivery. Posterior the first exposure to the virus, the patients with better immunity revealed stronger body responses. The role of Innate immune cells is critical and fundamental in reacting to various pathogens in effective and proactive ways [30]. Previous studies reported that the maternal immune system is completely ready to fight the attacks of foreign pathogens. Here the innate immune cells (such as monocytes and NK cells) interact powerfully with viral invasions. During pregnancy, the number of T and B cells decreases, where some adaptive immune responses reduce [31]. Concomitantly, maternal blood IgG antibodies are transferred to the fetus through the placental barrier in ordinary cases, which helps the fetus to get passive immunity [32]. Accordingly, the positive result of fetal IgG may be due to the transmission from the mother. Another study focused on infants delivered by SARS mothers reported that due to passive immunity progress at the end of pregnancy, there is a reduction of vertical transmission. It was confirmed by finding SARS-CoV-1 antibodies in some mothers' cord blood and breast milk [33].

There is growth in evidence from several studies on how to deal with pregnant women affected by COVID-19. Inducing immediate delivery must be based on the patient's situation and if there are any obstetric risk signs and not having COVID-19 infection [34-36].

### Conclusion

The author presented a preterm delivery of a high-risk case of a mother and her baby girl during the third trimester, where the mother was affected by Covid-19, which caused a case of premature rupture of membranes and vaginal bleeding. For achieving good outcomes during treating and managing pregnant Covid-19 cases, there is a need for a multidisciplinary team without ruling out HELLP syndrome. Among population groups, pregnant women and neonates are vulnerable, so there is a need to protect them from any chance of exposure to COVID-19.

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