

Effects of COVID-19 in Pregnancy

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ABSTRACT

The novel coronavirus (COVID-19) pandemic has emerged to be one of the scariest contagious diseases in recent times. It was first identified in December 2019 in a city named Wuhan in China. Since, then over millions of cases have been reported, with the numbers still rising, affecting over 150 countries and causing millions of deaths. The disease is caused by severe acute respiratory syndrome-CoV-2 and the main presenting symptoms are cough, fever, chills, fatigue, sore throat, and myalgia. While the health-line workers all over the world are fighting to combat this virus, there is a lot of fear and anxiety prevailing among people but there is an increased tension among the pregnant women. A lot of questions are being raised like should the pregnant individuals be extra cautious? Do they have an increased risk of suffering a miscarriage? Is there an increased risk of giving birth to preterm babies? Is it even advisable to plan for pregnancy during these tough times? In general, in pregnancy due to a change in the hormone levels and immune system functions there is an increased risk to catch a lot of infectious diseases prevailing around us, but a lot of case studies suggest that pregnant women do not seem to be at a greater risk for COVID-19 than other individuals. However, it is important to address this issue as the numbers have been rising rapidly with no specific cure available as of now.

Keywords: COVID-19, Fetal outcomes, Maternal outcomes, Pregnancy, Severe acute respiratory syndrome-CoV-2

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INTRODUCTION

General Points about the Virus and Its Spread

Coronaviruses are a group of spherical or pleomorphic medium sized (100–150 nm) viruses containing petal or club shaped peplomers on the surface.^[1] Novel coronavirus (COVID-19) which is caused by severe acute respiratory syndrome (SARS)-CoV-2 is one of the seven types of coronaviruses. Previously, the other two types have caused the Middle East respiratory syndrome and SARS. SARS-CoV-2 is an enveloped non-segmented positive sense RNA virus belonging to the family *Coronaviridae* and sub-family *Orthocoronaviridae*.^[1,2] These viruses cause respiratory infections whose symptoms can range from a mild flu to severe pneumonia-like complications. Fever or chills, cough, shortness of breath, fatigue, muscle or body aches, headache, loss of taste or smell, sore throat, nausea, vomiting, and diarrhea being some of the common presenting symptoms. COVID-19 primarily spreads through the respiratory tract, by droplets, the respiratory secretions and also through direct contact.^[3] It has been reported that SARS-CoV-2 was isolated from fecal swabs of a severe pneumonia patient at Sun Yat University, Guangdong, China.^[4] This indicates the possibility of transmission through multiple routes. The incubation period for COVID-19 is thought to extend to 14 days, with a median time of 4–5 days from exposure to symptoms onset.^[3,5,6] It has been said that children below 5 years and elderly individuals with comorbidities have an increased risk of suffering complications due to COVID-19.

Effects of COVID-19 in Pregnancy

Pregnant women being immunologically compromised are susceptible to a lot of infections prevalent in the society. They can be considered to be a vulnerable group; hence, studies have been done to assess if there is vertical transmission of the SARS-CoV-2 from the mother to the fetus and if there is a possibility for any complications in the mother which can further lead to fetal distress.

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A study was conducted on nine pregnant women with laboratory confirmed COVID-19 pneumonia based on maternal throat swab samples, which tested positive for SARS-CoV-2. They were admitted to a hospital in Wuhan. The cord blood and neonatal throat samples were tested to check for any vertical transmission of SARS-CoV-2. Breast milk samples were also collected from six of the nine patients. All the samples tested negative for SARS-CoV-2. None of the nine patients developed severe COVID-19 pneumonia complications or died. The symptoms they had were similar to the general symptoms such as cough, sore throat, myalgia, and malaise. Nine live births were recorded and none of them had neonatal asphyxia.^[7]

In another study conducted in the months of January and February in 2020, seven pregnant patients with COVID-19 were included in the study. All the patients had very high concentrations of C-reactive protein. According to the chest CT, 86% of them had bilateral pneumonia and 14% had unilateral pneumonia. All patients received oxygen therapy and anti-viral drugs such as OSELTAMAVIR, GANICICLOVIR, and INTERFERON.

The outcomes of all the pregnant women were good; at the end of the follow-up all of them were discharged. Three out of the four infants stayed back for observation, and the nucleic acid test for the throat swab of one neonate was positive at 36 h after birth. The neonate had no cough or fever but had mild shortness of breath and his chest X-ray revealed mild pulmonary infection. The

neonate was discharged after 2 weeks following two consecutive negative nucleic acid test results. After 28 days of birth, all the neonates were fully healthy with no respiratory symptoms.^[8]

Another study conducted on 18 pregnant women between January and March 2020, most of them had fever, cough, sore throat, fatigue, chest tightness, shortness of breath, diarrhea, and runny nose. CT scans showed 50% cases of unilateral pneumonia, 33% cases of bilateral pneumonia, and 11% cases of pulmonary infection. There were no abnormal changes in 6% of the cases. Thirteen of these pregnant women underwent a cesarean section because of complications such as premature rupture of membranes, preeclampsia, and fetal distress. Three of them did not improve after being put on antiviral therapy hence underwent a cesarean section. One patient had requested for a cesarean section and one patient had a normal vaginal delivery, coming to the neonates three of them were premature, one had neonatal asphyxia, and one has necrotizing enteritis, there were five cases of bacterial pneumonia, one case of gastrointestinal bleeding, one case of hyperbilirubinemia, and one case of neonatal diarrhea. The neonates were followed up till March 2020 and no neonatal death had occurred.^[9]

In Hubei Province 41 pregnant women, 11 non-pregnant adults and four children were included in a study. Throat swab samples were collected for RT-PCR. All patients also underwent non-enhanced CT examinations for detecting COVID-19 pneumonia. This study concluded that the clinical symptoms in pregnant women were of atypical type as compared to non-pregnant adults which causes difficulties in early detection. The consolidation lesions as revealed by CT examination were also more prevalent in the pregnant cases suggesting that the severity of COVID-19 was more in pregnant women.^[10]

A report of a 35th week pregnant woman in Zhejiang Province, China, suggests that there was no vertical transmission of the SARS-CoV-2 virus. The pregnant woman had dry cough, fever, chills, and shortness of breath and were confirmed to be positive for SARS-CoV-2 based on her sputum sample. Her chest radiograph showed scattered multiple patchy infiltrates in both her lungs. The baby was born healthy and an oropharyngeal swab specimen was taken immediately which tested negative for SARS-CoV-2 and the baby was sent to a negative pressure ward. The infant's oropharyngeal swab, blood, feces, and urine samples remained negative for SARS-CoV-2 for the next 2 days.^[11]

CONCLUSION

This article talks about the deadly COVID-19, regarding its spread, specifically highlighting the effects of SARS-CoV-2 in pregnancy. Various studies are being conducted to find out if there is a possibility for the vertical transmission of SARS-CoV-2 from the mother to the neonate since December 2019 after the first case report in Wuhan city, China. Few of the studies have been reviewed for a better understanding. The majority of them indicate good maternal and neonatal outcomes and that, the presentation of symptoms, in pregnant women were similar to those of non-pregnant individuals such as cough, sore throat, fever, and myalgia. However, when the mother's condition is aggravated a more effective antiviral therapy and a cesarean section is suggested as the mode of delivery to end the cardiopulmonary burden in the process of labor. Even though vertical transmission of SARS-CoV-2 was not detected, in majority of the cases the proportion of neonatal bacterial pneumonia was higher than other neonatal diseases in a newborn whose

mother was in the state of inflammatory stress or fever, after getting infected with COVID-19.^[9] It has also been suggested that effective implementation of protective measures and a negative-pressure delivery room is crucial to help prevent the transmission of SARS-CoV-2 to the neonate.^[11] It can be said that early detection may help in providing good care in pregnancy as antiviral treatment can be started early to prevent serious complications in the mother which may further cause fetal distress. Although neonatal deaths due to COVID-19 have not been reported, miscarriages suffered by the mother, preterm birth of infants and some amount of fetal distress have been noticed. It is suggested that the infant should be tested for SARS-CoV-2 immediately after birth so that effective treatment can be done. Breast milk samples of the mother came out negative for SARS-CoV-2 in most of the studies which suggest that it is okay for the mother to breast feed her infant but only after testing the sample for SARS-CoV-2. One study conducted on nine pregnant women from Iran with severe COVID-19 reported that seven of them died, one of them remained critically ill and ventilator dependent and one of them recovered after prolonged hospitalization. Contrary to the other studies this study reports mortality among pregnant women infected with SARS-CoV-2.^[12] Pregnant patients with pre-existing comorbidities such as hyperglycemia, obesity, and hypertension are at an increased risk for severe illness requiring ICU admissions and mechanical ventilation.^[13] Another study conducted on 108 pregnant women suggested severe maternal morbidity and perinatal deaths though maternal transmission of SARS-CoV-2 was not detected in majority of the reported cases.^[14] The current studies and the data available regarding the effects of COVID-19 in pregnancy are not sufficient to state in an unbiased manner whether or not there is vertical transmission of the SARS-CoV-2 from the mother to the fetus. The majority of the maternal and fetal outcomes were good when effective antiviral therapy was given and the mother and the neonate were monitored carefully. However, few reports which suggested complications in the mother which lead to miscarriages, preterm birth of infants or even death of the mother cannot be unseen, but like it is always said prevention is better than cure.

In these tough times where medical workers all over the world are risking their lives to help people fight this deadly virus it is everyone's duty to follow all the social distancing norms and take every precautionary measure to prevent its spread. The government of every state has been working extremely hard to protect its citizens and this burden has to be shared by the common public. Simple instructions like cleaning one's hands often with either plain soap and water or with an alcohol based sanitizer and maintain a safe distance from anyone who shows symptoms of COVID-19 and always wearing mask while stepping out must be followed. The most important thing to be remembered is to always seek medical attention if one develops fever, chills, cough, sore throat, shortness of breath, myalgia, runny nose, etc.

Pregnant individuals should be extra cautious since information regarding the specific effect of COVID-19 on pregnancy is not available yet.

- It is advised to be in regular touch with one's obstetrician and not miss any antenatal check-ups with the fear of contracting the virus.
- Eating healthy food, practicing yoga, meditation, or any form of calming exercise is advised to avoid unnecessary anxiety and stress.

- It is of paramount importance for the pregnant individuals to stay indoors and avoid un-necessary travel to prevent contracting the virus.
- Post-delivery, it is important to test the breast milk samples of the mother before initiating breast-feeding, and if the mother's are tested positive for COVID-19 it is advisable to wear masks around their infants to prevent transmitting the virus.

Further studies are required as current data available regarding the effects of COVID-19 in pregnancy are based on a limited number of subjects and the long-term outcomes of COVID-19 in the neonates are still unknown.

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