# Effects of the new coronavirus (covid19) on pregnancy and abortion: A systematic review

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## Abstract

The new coronavirus (Covid 19) has become a hazardous threat due to its prevalence worldwide. Pregnant women are particularly vulnerable to this infectious disease because their immune system is already slightly compromised during pregnancy, making them more susceptible to viral infections**.** Therefore, the aim of this study was to investigate abortion due to this disease in different countries of the world. Thirty-six articles were analyzed by searching the web of science, Google Scholar, Pubmed databases for the following keywords: Covid 19 and abortion, Covid 19 and fetus, and Covid 19. Thirteen out of the 36 articles were used, and the rest were excluded from the study due to being unrelated to the subject. Articles related to the new coronavirus and abortion were then carefully studied and analyzed. It was shown in various studies that, due to the infection and immune system compromise during pregnancy, the Coronavirus could play a role in abortion and stillbirth. So, a prognosis of this threat could help pregnant women observe the health protocols during the pandemic more seriously so that they are more protected against being infected.

**Keywords:** Covid 19, Pregnancy, Abortion

## Introduction

Due to its prevalence worldwide, the new coronavirus (Covid 19) has become a hazardous threat to health. This respiratory condition results from the new strain SARS-Cov-2 of the coronavirus. The virus emerged primarily in Wuhan, China, in December 2019 (1-4). Due to its rapid spread, cases were diagnosed in 216 countries until December 1, 2020, leading to about 855352 fatalities (5-9). In response to the rapid prevalence of Covid 19, on 30 January, the WHO regarded the virus as a serious threat and a common problem among the countries and assigned all countries to take measures to prevent its prevalence. This disease could affect everyone, especially those with compromised immune systems, such as the elderly, pregnant women, etc. Pregnant women are particularly vulnerable to this infectious disease because their immune system is already slightly compromised during pregnancy, making them more susceptible to viral infections. So, Covid 19

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may have serious consequences for pregnant women (10). Since the virus affects the respiratory system during pregnancy, viral respiratory infections induce increased side effects for women and childbirth. The fact that physiological and immunological transformations occur as a natural part of the pregnancy; could be influenced by Covid 19. The exacerbated side effects may increase the mother fatality, abortion, and stillbirth.

## Materials and Methods

Considering the prevalence of the coronavirus worldwide and the importance of pregnancy and pregnant women in every society, we are to review the various articles that addressed this issue. Thirty-six articles were analyzed by searching the web of science, Google Scholar, Pubmed databases for the following keywords: Covid 19 and abortion, Covid 19 and the fetus, Covid 19 and the fetus, and Covid 19. Thirteen out of the 36 articles were used, and the rest were excluded from the study due to being unrelated to the subject. The following table (Table 1) summarizes several articles that have shown that this new virus causes abortions, and a number of abortions caused by the new coronavirus from 2019 to 2020 in the countries under study.

**Table 1.** Abortions due to new coronavirus.

| Country name | Number of abortions |
|---|---|
| Bangladesh | 12 abortions |
| Brazil | 5 abortions |
| El-Gharbia Governorate | 30 abortions |
| Egypt | 1 abortions |

Effects of Covid 19 Around the World

In a study by Choudhury et al. on the miscarriage of women with Covid 19 in Bangladesh, the authors concluded that pregnant women are particularly vulnerable to this infectious disease. Twelve cases of miscarriage had been reported in this country without any reason except RT-PPCR Covid-19 from March to July 2020 in a medical university hospital in Bangladesh. All 12 cases lacked any clinical and childbirth disorder, but all had Covid 19 infection, and this clearly shows that the Covid 19 infection may lead to fetal death likely due to the inflammation in the placenta(11).

In another study by Richtmann et al. on the fetal death due to the SARS-Cov-2 infections in pregnant women in Brazil, it was concluded that there are few cases of abortion or stillbirth in SARS-Cov-2 infected women. In this study, there were five consecutive cases of fetal death (12 weeks) lacking any other causes in women with positive RT-PCR COVID-19 tests in the Brazilian institute. All cases: All five women had mild to moderate Covid 19 and did not take any medication; all were overweight or obese and had no comorbidities or pregnancy complications that could contribute the fetal death. The fetal death at 21 and 38 weeks of gestation had occurred due to the Covid 19 infection. RT-PCR detected SARS-Cov-2 in amniotic fluid in one case and placenta samples in two cases. All five women had acute chorioamnionitis in placental histology with extensive fibrindeposition. These five cases of fetal death in women with COVID-19 without any clinical or obstetric-specific abnormalities indicate that fetal death could result from SARS-CoV-2 infection during pregnancy. The severe inflammatory reaction of the placenta in all five cases increases the likelihood of a direct effect of SARS-CoV-2 on the placenta (12).

In addition, in the study of Gaheen et al., investigating the effect of COVID-19 on pregnancy outcomes in Al-Gharbia province, it was found that pregnancy partially contributes to the immune system compromise and it makes pregnant women more vulnerable to infection. This has serious consequences for pregnancy outcomes. This study aimed at evaluating the effect of COVID-19 on pregnancy outcomes. The results indicated that about one-third of the women studied had a low level of knowledge, and about two-fifths



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had adopted unfavorable COVID-19-related procedures. The results also showed that COVID-19 has a negative effect on pregnancy outcomes. Based on the findings of this study, it can be concluded that the pregnant women studied had sufficient knowledge and unfavorable procedures regarding COVID-19. It seems that more studies are required to evaluate the effect of COVID-19 on pregnancy outcomes (13).

In yet another study by Hong Liu et al. on why pregnant women are prone to be infected by Covid 19, these women were immunologically studied. The authors found that this virus could affect all age groups, but pregnant women could be especially susceptible to Covid 19 because they are generally susceptible to respiratory infections. In pregnant women with Covid 19, there is no evidence of the vertical transmission of the virus, but there is evidence of more prevalent preterm delivery (14).

It was stated in another study that all age groups, especially newborns, are vulnerable to Covid 19. In the meantime, the effect of Covid 19 on pregnant women has not been properly studied (15,16).

In two other studies on the illness of the mother, death, and prenatal outcomes, the clinical characteristics of mothers (n=18) with Novel Coronavirus Pneumonia (NCP) in the third trimesters of pregnancy (from 31th to 40$^{th}$ week) and their newborns were analyzed. In total, 18 pregnant women with NCP and the average age of 30 had one or two common clinical symptoms such as fever, cough, cholecystitis, sore throat, and diarrhea. Ten out of 18 pregnant women who had been hospitalized before week 37 of pregnancy had premature childbirth, and some had a stillbirth. These complications that had been causally related to Covid-19 need to be studied further. Also, current studies have found that pregnant women could be particularly susceptible to Covid 19 (17,18).

In addition, during pregnancy, the upper respiratory tract is prone to inflammation due to the high level of estrogen and progesterone. Confined lung expansion makes the pregnant woman sensitive to respiratory pathogenesis. Various evidence shows that systemic viral infections of the mother could affect pregnancy (19). The literature has shown that infection to SARS during pregnancy may result in high rates of miscarriage, preterm delivery, and intrauterine growth restrictions (20).

In the meantime, these complications may be due to the direct effect of viruses on mothers. Despite the limited evidence, we cannot ignore the potential risk of infections for pregnant women and fetuses. It has recently been shown that COVID-19 infection is associated with a cytokine storm (21). When pregnant women are diagnosed with inflammation in their first and third trimesters, the cytokine storm from SARS-Cov-2 may cause more severe inflammation in these women. Additionally, maternal inflammation from viral infection during pregnancy may affect the fetus in various ways (22).

Due to the severity of the disease and the pregnancy progression (during pregnancy trimester), we should pay more attention to pregnant women with COVID-19 in the first and second trimesters. Although there is no evidence to support the possibility of vertical transmission of COVID-19 from mother to child with certainty, existing studies indicate that even if the virus does not infect the fetus, maternal infection and inflammation due to the virus can still infect the growing fetus. Early diagnosis and intervention in COVID – 19 may reduce potential delivery complications such as pregnancy loss, intrauterine growth restriction, and preterm delivery and may also help improve pregnancy outcomes (22).

## Discussion

The present study aimed at giving information about the risks of new coronavirus on miscarriage. Pregnancy is an immunocompromised state and, for this reason, a pregnant woman is at a higher risk



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of getting infected as compared with a healthy individual (23). Numerous studies have shown that the new coronavirus can play a role in abortion and stillbirth due to the infection and the immune system compromise in pregnant women (11). Therefore, the prognosis of this risk may help pregnant women observe health protocols more seriously during the pandemic so that these women are less affected by the virus. On the other hand, it is very important in the treatment of pregnant women to investigate the COVID-19 antiviral treatment methods, such as lopinavir and ritonavir, and balance their pros and cons (24). Treatment may start when the potential benefits outweigh the risks to the fetus. Even after the viral infection is managed, fetal intrauterine growth should be closely monitored because early pregnancy information is scarce, and the placental inflammation may persist for a long time (14). Pregnant women with COVID-19 should be cared for throughout the pregnancy period. Since infection is one of the main causes of abortion and stillbirth, and on the other hand, immune system disorders may lead to abortion, it can be said that abortion for any reason may cause physical and psychological problems for women.

## Conclusion

Studies have shown that Covid 19 can cause miscarriage in sick people and even in people without a history of the disease, which can be caused by stress or infections caused by the virus. Abortion, lung infections, nerve problems, etc. are serious complications of this virus.

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## Conflicts of interest

The authors declare that they have no conflict of interest.

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