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Covid and pregnancy in the United States – an update as of August 2022

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Abstract: COVID-19 is caused by the 2019 novel coronavirus (2019-nCoV). The first cases of COVID-19 were identified in December 2019, and the first United States (US) case was identified on January 20th, 2020. Since then, COVID-19 has spread throughout the world and was declared a pandemic by the WHO on March 11, 2020. As of July 2022, about 90 million persons have been infected with COVID-19 in the US, and there have been over 1 million deaths There have been 224,587 pregnant patients infected with COVID-19, and 34,527 were hospitalized. Pregnancy increases the risk of severe disease associated with COVID-19 and vaccinated patients are significantly less likely to develop severe disease. Adverse pregnancy and neonatal outcomes are more common among women infected with SARS-CoV-2 during pregnancy, especially among those with severe disease, and vaccination also protects the newborn infant. The intrauterine transmission of SARS-CoV-2 appears to be rare. COVID-19 vaccinations and booster shots in pregnancy are safe. In addition, the available data suggest that vaccination during pregnancy is associated with the transmission of SARS-CoV-2 antibodies to the fetus. The vaccination of lactating women is associated with high levels of SARS-CoV-2 antibodies in the breast milk. It is important that with future pandemics the concept of vaccine recommendations in pregnancy should be made early on to prevent maternal, fetal, and neonatal morbidity and mortality. Physicians and other healthcare professionals should strongly recommend COVID-19 vaccination to patients who are pregnant, planning to become pregnant, and to those who are breastfeeding.

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Introduction

COVID-19 is caused by the 2019 novel coronavirus (2019-nCoV). The first cases of COVID-19 were identified in December 2019, and the first United States (US) case was identified on January 20th, 2020. Since then, COVID-19 has spread throughout the world and was declared a pandemic by the WHO on March 11, 2020 [1].

As of July 2022, about 90 million persons have been infected with COVID-19 in the US, and there have been over 1 million deaths [2] There have been 224,587 pregnant patients infected with COVID-19, and 34,527 were hospitalized. The first death of a pregnant woman from COVID-19 was reported in March 2020, and as of July 2022 there have been 305 deaths of pregnant women, with the majority (155) of deaths occurring in the seven months between August 2021 and February 2022 [3–6].

How does COVID-19 affect pregnancy?

Presently, the full effects of COVID-19 infection on pregnant women are not yet completely understood, mostly because evidence is still accumulating. Theoretically, physical changes in pregnancy could potentially affect susceptibility to COVID-19 during pregnancy, however limited data are available to address this issue, though many studies report that pregnant women are not more likely to become infected with COVID-19 than nonpregnant women. Although the overall risks are low, pregnant women who become infected are at an increased risk for severe illness from COVID-19 when compared to those who are not pregnant.

It needs to be emphasized that COVID-19 infection has proven adverse effects both on the mother and the soon-to-be-born child. SARS-19 infection during pregnancy is associated with a number of adverse pregnancy outcomes including an increased risk of preeclampsia, preterm birth, gestational diabetes, and low birthweight and stillbirths

among pregnant women with SARS-CoV-2 infection when compared to those without SARS-CoV-2 infection and especially when the infection was more severe [7–10].

Having certain underlying medical conditions, and other factors, can further increase the risk for developing severe COVID-19 illness during or recently after pregnancy (for at least 6 weeks following end of pregnancy) [5]. All-cause pneumonia has been linked to preterm labor, premature rupture of membranes, fetal growth restriction, and fetal death in addition to neonatal demise.

According to CDC data, pregnant women are 2–3 times more likely to be admitted to an intensive care unit (ICU) (10.5 vs. 3.9 per 1,000), 2.9 times more likely to require invasive ventilation (2.9 vs. 1.1 per 1,000 cases), 2.4 times more likely to require extracorporeal membrane oxygenation (0.7 vs. 0.3 per 1,000 cases), 1.7 times more likely to die (1.5 vs. 1.2 per 1,000 cases). Pregnant women also have an increased risks of hospital admission, need for oxygen therapy, need for endotracheal intubation, an elevated case-fatality rate among pregnant women compared with nonpregnant women of similar age [11–13].

Similar to what is observed in nonpregnant persons, SARS-CoV-2 infection is more frequent among the persons who live in socially and economically disadvantaged settings and Hispanic ethnicity, lack of health insurance, high neighborhood density, and paradoxically, smaller household size [14, 15]. Data from the United Kingdom and the US System found that black race, older age, underlying medical conditions such as obesity, chronic lung disease, chronic hypertension, pregestational diabetes mellitus and being overweight or obese were the risk factors for hospitalization among pregnant persons [16, 17].

Maternal-fetal and neonatal transmission of SARS-CoV-2

Maternal-fetal intrauterine viral transmission of COVID-19 prior to birth is rare, though there are some cases documented [18, 19].

Postpartum, there is a potential risk of SARS-CoV-2 transmission to the neonate via contact with infectious respiratory secretions from the mother, caregiver, or other persons with SARS-CoV-2 infection, including immediately before the individual develops symptoms when viral replication may be high. Most SARS-CoV-2 infections identified among infants after birth are due to exposure to infected caregivers, and the data on the safety of an SARS-CoV-2-infected mother breastfeeding are reassuring [20], especially with consistent use of surgical masks, hand hygiene, and breast cleansing [21]. A systematic review found no increase in late postnatal transmission (after 3 days after birth) associated with breastfeeding though an increased risk of late postnatal transmission was observed when the infants were not separated from their infected mothers after birth [22]. Presently, the CDC recommends that infants born to mothers with known SARS-CoV-2 at the time of delivery should be considered to have suspected infection and should be tested and isolated from other healthy infants. Whether to keep a mother with known or suspected COVID-19 and infant together or separated after birth should be made on a case-by-case basis and after counseling between the mother and her physicians [23, 24]. The American Association of Pediatrics (AAP) recommends that mothers and newborns may room-in according to usual practices, the mother should wear a mask and use hand-hygiene, and health care providers should use gowns, gloves, N95 respirators, and eye protection when caring for well infants when care is provided in-room when the mother has COVID-19, and breastfeeding is encouraged with the same precautions [24].

Management of COVID-19 infection in pregnancy

A COVID-19 infection in pregnancy in and by itself is not an indication for delivery and should not alter the timing nor the mode of delivery. A cesarean delivery is indicated only with the usual obstetric indications.

With some differences, the clinical management of pregnant women with COVID-19 is similar to that of nonpregnant persons, and effective treatments should not be withheld based on the pregnancy status [25]. This includes antiviral therapy, several types of monoclonal antibodies, and prophylactic anticoagulation for hospitalized patients with COVID. There are regular updates and changes for the management of COVID-19 and pregnancy, and the National Institutes of Health (NIH) and the Society for Maternal and Fetal Medicine (SMFM) are regularly updating most recent recommendations which can be found online [26, 27].

COVID-19 vaccination in pregnant and lactating persons

Vaccination against COVID-19 has been available since December 2020 and is the best method to reduce maternal

and fetal complications of SARS-CoV-2 infection. Maternal vaccination in pregnancy protects against maternal morbidity and mortality and also protects her infant [28, 29].

There was initial reluctance by professional organizations to recommend vaccination of pregnant women. The significantly lower vaccine acceptance rate of pregnant women led to a significant increase in maternal mortality at the end of 2021. COVID-19 vaccination during pregnancy has been the lowest among persons of Black and Hispanic race and among younger women (aged 18–24 years) [30], and there continues to be a low vaccine acceptance by pregnant women, especially by non-Hispanic black women [31].

As early as February 2021 Chervenak et al. [32] laid out a professionally responsible COVID-19 vaccination counseling guide for patients who are pregnant, planning to become pregnant, and breastfeeding or planning to breastfeed. A recommendation by a physician or another health care professional is crucial to improve vaccine acceptance [32, 33]. The authors advocate that clinicians should strongly recommend COVID-19 vaccinations and how this assessment should be presented to patients during the informed consent process with the goal of empowering them to make informed decisions. Despite their strong arguments in support of recommending vaccination for pregnant women, professional organizations such as ACOG and SMFM did not recommend COVID-19 vaccination to pregnant women at that time. Their reluctance was described as "physician hesitancy", and Chervenak et al. [33] said that "… the longer physician hesitancy continues and the longer the low vaccine acceptance rate of pregnant women lasts, preventable serious diseases, deaths of pregnant women, intensive care unit admissions, stillbirths, and other maternal and fetal complications of unvaccinated women will continue to occur." [33] Unfortunately, their fears have become reality when, possibly as a result of physician hesitancy and delaying vaccine recommendations for pregnant women by major organizations until later in 2021, many unvaccinated women died at the end of 2021 and beginning of 2022 as a consequence of a lower vaccine acceptance rate by pregnant women [4].

We believe that physicians and other health care providers should continue to strongly recommend COVID-19 vaccinations to pregnant patients, those trying to get pregnant, and those who breastfeed who initially decline vaccination.

There are three COVID-19 vaccines currently available in the US: 2 mRNA vaccines (from Pfizer-BioNTech, New York, NY and Germany Moderna, Cambridge, MA) and one adenoviral vector vaccine (Johnson & Johnson–Janssen, Belgium). The CDC specifies that any of the currently authorized vaccines can be administered to pregnant or lactating persons, with no preference for the vaccine type [34].

In several analyses of pregnant women who received an mRNA vaccine, no concerning safety signals were seen [35–37].

In terms of vaccine effectiveness in pregnancy, studies indicate that the administration of the mRNA vaccines results in a robust maternal humoral response. Although the antibody response to vaccination among pregnant patients has not been rigorously compared with the response among nonpregnant patients, there is no reason to expect differences. Furthermore, maternal immunoglobulin G antibodies efficiently cross the placenta, resulting in relatively high titers in the fetus (Jamieson AJOG 2–2022). There are no known or theoretical risks of vaccination of breastfeeding women and there are no restrictions to the vaccination.

Women should be reassured that COVID-19 vaccines do not affect fertility, that COVID-19 vaccines cannot cause COVID-19 as none of them contain the live virus, that the COVID-19 vaccines do not interact with or alter genetic material, and that the vaccines do not contain any controversial substances [38].

Conclusions

Evidence shows that pregnancy increases the risk of severe disease associated with COVID-19 and that vaccinated patients are significantly less likely to develop severe disease. Adverse pregnancy and neonatal outcomes are more common among women infected with SARS-CoV-2 during pregnancy, especially among those with severe disease, and vaccination also protects the newborn infant. The intrauterine transmission of SARS-CoV-2 appears to be rare. COVID-19 vaccinations and booster shots in pregnancy are safe. In addition, the available data suggest that vaccination during pregnancy is associated with the transmission of SARS-CoV-2 antibodies to the fetus. The vaccination of lactating women is associated with high levels of SARS-CoV-2 antibodies in the breast milk. Data on vaccine coverage suggest that pregnant women have been less likely to receive a COVID-19 vaccine despite their increased risk for severe disease and the risks of adverse pregnancy and neonatal outcomes if infected. This lower vaccine acceptance rate is consistent with physician hesitancy who fail to recommend vaccination in pregnancy, and a significant delay in vaccine recommendations in pregnancy by professional organizations. It is important that with future pandemics the concept of vaccine recommendations in pregnancy should be made early on to prevent maternal, fetal, and neonatal morbidity and mortality.

In conclusion, physicians and other healthcare professionals should strongly recommend COVID-19 vaccination to patients who are pregnant, planning to become pregnant, and to those who are breastfeeding or planning to breastfeed.

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