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Coronavirus and Pregnancy

- ▶ The coronavirus disease 2019 (COVID-19), caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), is a global public health emergency.
- ▶ Coronaviruses are positive-sense ribonucleic acid (RNA) viruses belonging to the family Coronaviridae.
- ▶ Since the first case of COVID-19 pneumonia was reported in Wuhan, Hubei Province, China, in December 2019, the infection has spread rapidly to the rest of China and beyond.¹⁻³

Coronavirus and Pregnancy

- ▶ The epidemics of the two β - coronaviruses, severe acute respiratory syndrome coronavirus (SARS-CoV) and Middle East respiratory syndrome coronavirus (MERS-CoV), have caused cumulative cases in the past two decades, with mortality rates of 10% for SARS-CoV and 37% for MERS-CoV.⁵⁻⁹
- ▶ SARS-CoV-2 belongs to the same β -coronavirus subgroup and it has genome similarity of about 80% and 50% with SARS-CoV and MERS-CoV, respectively.¹⁰



Coronavirus and Pregnancy

- ▶ latest report from the World Health Organization (WHO) on March 3rd, ¹¹ estimated the global mortality rate of COVID-19 to be 3.4%; although recent reports that have used appropriate adjustment for the case ascertainment rate and the time lag between symptoms onset and death suggest the mortality rate to be lower at 1.4%.¹²



Coronavirus and Pregnancy

- ▶ Pregnant women are particularly susceptible to respiratory pathogens and severe pneumonia, because of the physiologic changes in the immune and cardiopulmonary systems (e.g. diaphragm elevation, increased oxygen consumption, and edema of respiratory tract mucosa), which can render them intolerant to hypoxia.

Coronavirus and Pregnancy

- ▶ The 1918 influenza pandemic caused a mortality rate of 2.6% in the overall population, but 37% among pregnant women. ¹³
- ▶ In 2009, pregnant women were reported to be at an increased risk for complications from the pandemic H1N1 2009 influenza virus infection, with a higher estimated rate of hospital admission than in the general population. ¹⁴
- ▶ In 2003, it was reported that around 50% of pregnant women who developed SARS-CoV were admitted to the intensive care unit (ICU), around 33% of pregnant women with SARS-CoV required mechanical ventilation, and the mortality rate was as high as 25% for these women. ¹⁵



Coronavirus and Pregnancy

- ▶ To date, data on the effect of COVID-19 in pregnancy are limited to small case series.¹⁶⁻²⁰
- ▶ Recent studies of pregnant women with COVID-19 pneumonia is to evaluate the clinical characteristics and outcomes in pregnancy and the vertical transmission potential of SARS-CoV-2 infection.

Coronavirus disease 2019 (COVID-19) in pregnant women

- ▶ American Journal of Obstetrics and Gynecology (AJOG)
- ▶ To evaluate the clinical characteristics and outcomes in pregnancy and the vertical transmission potential of SARS-CoV-2 infection.
- ▶ Clinical records were retrospectively reviewed for 116 pregnant women with COVID-19 pneumonia from 25 hospitals in China between January 20 and March 24, 2020. Evidence of vertical transmission was assessed by testing for SARS-CoV-2 in amniotic fluid, cord blood, and neonatal pharyngeal swab samples.

Coronavirus disease 2019 (COVID-19) in pregnant women

► Results

- The mean age was 30.8 (range 24-41) years. The most common symptoms were fever (50.9%, 59/116) and cough (28.4%, 33/116); 23.3% (27/116) patients presented without symptoms. Abnormal radiologic findings were found in 96.3% (104/108) of cases.
- There were eight cases (6.9%, 8/116) of severe pneumonia but no maternal deaths. One of eight patients (1/8) that presented in the first- and early-second-trimester had a missed spontaneous abortion. Twenty-one of 99 patients (21.2%, 21/99) that had delivered had preterm birth. There was one case of severe neonatal asphyxia that resulted in neonatal death.
- Eighty-six of the 100 neonates that had testing for SARS-CoV-2 had negative results, of these ten neonates had paired amniotic fluid and cord blood samples that were tested negative for SARS-CoV-2.

Coronavirus disease 2019 (COVID-19) in pregnant women

- ▶ Conclusions
- ▶ SARS-CoV-2 infection during pregnancy is not associated with an increased risk of spontaneous abortion and spontaneous preterm birth. There is no evidence of vertical transmission of SARS-CoV-2 infection when the infection manifests during the third-trimester of pregnancy.
- ▶ Condensation:
- ▶ The clinical characteristics and pregnancy outcomes in 116 pregnant COVID-19 cases in China were reported and COVID-19 during pregnancy is not associated with an increased risk of spontaneous abortion and spontaneous preterm birth.

COVID19 during pregnancy: a systematic review

- ▶ American Journal of Obstetrics and Gynecology (AJOG)
- ▶ **Objective:** To conduct a **systematic review** of the outcomes reported for pregnant patients with COVID 19.
- ▶ **Results:** 6 studies including 51 women were eligible for the systematic review. Three pregnancies were ongoing at the time of the report; of the remaining 48, 46 were delivered with a cesarean section and 2 vaginally; there was 1 stillbirth and 1 neonatal death.
- ▶
- ▶ • **Conclusions:** Although vertical transmission of SARS-Cov2 has been excluded thus far and the outcome for mothers and fetuses has been generally good, **the high rate of preterm cesarean delivery is a reason for concern.**
- ▶ These interventions were typically elective, and it is reasonable to question whether they were warranted or not.
- ▶ COVID-19 associated with respiratory insufficiency in late pregnancies certainly **creates a complex clinical scenario.**

Coronavirus Disease 2019 (COVID-19) and pregnancy: what obstetricians need to know (AJOG)

- ▶ Coronavirus disease 2019 is an emerging disease with a rapid increase in cases and deaths since its first identification in Wuhan, China, in December 2019. Limited data are available about coronavirus disease 2019 during pregnancy; however, information on illnesses associated with other highly pathogenic coronaviruses (ie, severe acute respiratory syndrome and the Middle East respiratory syndrome) might provide insights into coronavirus disease 2019's effects during pregnancy.
- ▶ Coronaviruses cause illness ranging in **severity** from the common cold to severe respiratory illness and death. Currently the primary epidemiologic risk factors for coronavirus disease 2019 include travel from mainland China (especially Hubei Province) or close contact with infected individuals within 14 days of symptom onset.

Coronavirus Disease 2019 (COVID-19) and pregnancy: what obstetricians need to know (AJOG)

- ▶ Data suggest an incubation period of 5 days (range, 2-14 days). Average age of hospitalized patients has been 49-56 years, with a third to half with an underlying illness. Children have been rarely reported.
- ▶ Men were more frequent among hospitalized cases (54-73%). Frequent manifestations include fever, cough, myalgia, headache, and diarrhea. Abnormal testing includes abnormalities on chest radiographic imaging, lymphopenia, leukopenia, and thrombocytopenia.
- ▶ Initial reports suggest that acute respiratory distress syndrome develops in 17-29% of hospitalized patients. Overall case fatality rate appears to be 1%; however, early data may overestimate this rate.
- ▶ In 2 reports describing 18 pregnancies with coronavirus disease 2019, all were infected in the third trimester, and clinical findings were similar to those in nonpregnant adults. Fetal distress and preterm delivery were seen in some cases. All but 2 pregnancies were cesarean deliveries and no evidence of in utero transmission was seen.

Coronavirus Disease 2019 (COVID-19) and pregnancy: what obstetricians need to know (AJOG)

- ▶ Currently no coronavirus-specific treatments have been approved by the US Food and Drug Administration. **Because coronavirus disease 2019 might increase the risk for pregnancy complications, management should optimally be in a health care facility with close maternal and fetal monitoring.**
- ▶ **Principles of management** of coronavirus disease 2019 in pregnancy include early isolation, aggressive infection control procedures, oxygen therapy, avoidance of fluid overload, consideration of empiric antibiotics (secondary to bacterial infection risk), laboratory testing for the virus and coinfection, fetal and uterine contraction monitoring, early mechanical ventilation for progressive respiratory failure, individualized delivery planning, and a **team-based approach** with multispecialty consultations.
- ▶ Information on coronavirus disease 2019 is increasing rapidly. Clinicians should continue to follow the Centers for Disease Control and Prevention website to stay up to date with the latest information (<https://www.cdc.gov/coronavirus/2019-nCoV/hcp/index.html>).

New Corona Virus (COVID-19) Management in Pregnancy and Childbirth: Reviews (Arch Clin Infect Dis)

- ▶ In this review study,
- ▶ 12 articles and 11 guidelines and recommendations were obtained.
- ▶ The general principles of caring for women in pregnancy and childbirth included early separation, using aggressive infection control methods, non-administration of corticosteroids repeatedly, oxygen therapy, preventing from fluid overload, using empirical antibiotics (due to the risk of secondary bacterial infection), co-infection testing of other infections, avoiding breastfeeding in mothers with definitive positive tests, and being cautious in suspicious cases.
- ▶ **Conclusions:** Given the limited information on the complications and outcomes of the virus in pregnancy and childbirth and the increasing number of studies, the provision of up-to-date care according to global and regional processes and guidelines is recommended for others affected and suspected with COVID-19.

General Principles of Management of Pregnant Women with Confirmed or Suspected Coronavirus 2019 (10, 40, 44)

1. Patients with respiratory symptoms should cover their face with a mask and be ventilated separately and well at least six feet from other persons.
2. Confirmed and suspected cases of COVID-19 should be isolated as soon as possible in an isolated room(AIIR).
3. The CDC infection prevention and control measures should be taken for health care providers, including standard, contact, and air precautions. N95 eye protection and proper respiration should be used.
4. The staff should be provided with the proper use of personal protective equipment. Training protective equipment (PPE) should be done including the correct method of landfilling. Hospital infection control personnel should be contacted.
5. In coordination, relevant samples should be collected and sent for SARS-CoV-2 diagnostic testing.
6. Access to the room of confirmed or suspected patients should be restricted for visitors and healthcare personnel.

General Principles of Management of Pregnant Women with Confirmed or Suspected Coronavirus 2019 (10, 40, 44)

7. Pregnancy should be considered a dangerous situation. The fetal heart rate and uterine contractions should be checked.
8. For starters, oxygen therapy should be considered (for O₂ saturation with a target of 95 and/or pO₂ 70mmHg).
9. Early mechanical ventilation should be considered with evidence of the progression of respiratory failure.
10. Other viral respiratory infections and bacterial infections should be monitored (due to potential complications of infection).
11. Experimental antimicrobial therapy should be considered (because of the risk of other bacterial infections).

General Principles of Management of Pregnant Women with Confirmed or Suspected Coronavirus 2019 (10, 40, 44)

11. Corticosteroids should not be used frequently.
12. The use of steroids to enhance fetal lung maturation in individuals with anticipated preterm labor can be considered individually.
13. If septic shock is suspected, targeted management should be done quickly.
14. Decisions on childbirth and termination of pregnancy should be based on the age of the pregnancy, maternal status, fetal stability, and maternal wishes.
15. Gynecologists and perinatal, intensive care, anesthesia, and midwifery specialists should be consulted with.
16. Patients and their families should be talked about diagnosis and clinical status.

Treatment Recommendations for Pregnant Women with COVID-19

Therapeutic Recommendations:

- a. Provide extra oxygen to maintain oxygen saturation above 95%.
- b. Consider termination of pregnancy to improve maternal oxygenation.
- c. If mechanical ventilation is required, keep pregnant patients in the left lateral position to maximize uterine blood flow.
- d. Consider empirical antibiotics to prevent secondary bacterial infections.
- e. Keep close and vigilant monitoring and timely interventions to minimize maternal hypoxia. (10, 40)

Postpartum mothers

Negative testing / no clinical symptoms of coronavirus

Routine midwifery care according to maternity protocols and training in the principles of coronary care during and after hospital discharge

Determine the postpartum visitation date at the health center and emphasize visiting a health center or comprehensive health center

Positive testing / clinical or suspected coronavirus symptoms

Providing Postpartum care

- 1- Controlling vital signs especially temperature
 - 2- Pay attention to fluid intake
 - 3- Pay attention to urinary output and emphasizing on non-breastfeeding
- Visit by an infectious disease specialist

Discharge from the Labor and delivery section or operating room and transfer to

Department of
Infectious Diseases and ICU

Department of
Obstetrics /Gynecology

WHO Are pregnant women at higher risk from COVID-19?

- ▶ Research is currently underway to understand the impacts of COVID 19 infection on pregnant women. Data are limited, but at present there is no evidence that they are at higher risk of severe illness than the general population.
- ▶ However, due to changes in their bodies and immune systems, we know that pregnant women can be badly affected by some respiratory infections. It is therefore important that they take precautions to protect themselves against COVID-19, and report possible symptoms (including fever, cough or difficulty breathing) to their healthcare provider.
- ▶ WHO will continue to review and update its information and advice as more evidence becomes available.
- ▶ [www.who.int > news-room > q-a-detail > q-a-on-covid-19..](http://www.who.int/news-room/q-a-detail/q-a-on-covid-19)

WHO Should pregnant women be tested for COVID-19?

- ▶ Testing protocols and eligibility vary depending on where you live.
- ▶ However, WHO recommendations are that pregnant women with symptoms of COVID-19 should be prioritized for testing. If they have COVID-19, they may need specialized care.

WHO Can babies get the coronavirus disease?

- ▶ We know it is possible for people of any age to be infected with the virus, but so far there are relatively few cases of COVID-19 reported among children.

WHO Do pregnant women with suspected or confirmed COVID-19 need to give birth by caesarean section?

- ▶ No. WHO advice is that caesarean sections should only be performed when medically justified.
- ▶ The mode of birth should be individualized and based on a woman's preferences alongside obstetric indications.

WHO Can COVID-19 be passed from a woman to her unborn or newborn baby?

- ▶ We still do not know if a pregnant woman with COVID-19 can pass the virus to her foetus or baby during pregnancy or delivery. To date, the virus has not been found in samples of amniotic fluid or breastmilk.



Glossary of terms

- ▶ **2019-nCoV:** 2019-novel coronavirus (previous name for COVID-19 and SARS-CoV-2).
- ▶ **•Basic reproduction number:** estimate of number of individuals who will become infected from a single person in a population in which all individuals are susceptible.
- ▶ **•CDC:** US Centers for Disease Control and Prevention.
- ▶ **•COVID-19:** coronavirus disease 2019 (previously called 2019 novel coronavirus [2019-nCoV]; illness caused by SARS-CoV-2.
- ▶ **•MERS:** Middle East respiratory syndrome.
- ▶ **•MERS-CoV:** Middle East respiratory syndrome coronavirus, virus that causes Middle East respiratory syndrome (MERS).
- ▶ **•N95 respirator:** respiratory protective device that removes at least 95% of very small (0.3 μm) test particles; also called N95 filtering facepiece respirator.
- ▶ **•SARS:** severe acute respiratory syndrome.
- ▶ **•SARS-CoV:** severe acute respiratory syndrome coronavirus, virus that caused severe acute respiratory syndrome (SARS).
- ▶ **•SARS-CoV-2:** severe acute respiratory syndrome coronavirus 2 virus (current name of the novel coronavirus, according to the International Committee on Taxonomy of Viruses), virus that causes COVID-19.
- ▶ **•WHO:** World Health Organization.