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Obstetric Management in Maternal with COVID-19: A Narrative Literature Review

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A B S T R A C T

The incidence of COVID-19 in pregnant women varies by geographic region and population. However, pregnant women may be at an increased risk of COVID-19 infection compared to non-pregnant women. Several risk factors have been identified for severe COVID-19 illness in pregnant women, including maternal age, obesity, chronic medical conditions, ethnicity, gestational age, and multiple pregnancies. Screening and testing for COVID-19 in pregnant women is essential to prevent transmission and ensure appropriate management. Pregnant women should be screened for symptoms at each prenatal visit, and those with symptoms or high-risk exposures should be tested using a PCR-based assay. Repeat testing may be necessary in certain situations, and universal testing may be implemented in some healthcare facilities. Antibody testing is not currently recommended for diagnosis or management of pregnant women. The delivery management of pregnant women with COVID-19 should be individualized based on the severity of the illness, gestational age, and fetal status. The neonatal management of infants born to mothers with COVID-19 should focus on the prevention of transmission and optimization of neonatal outcomes. Neonates should be evaluated for COVID-19 using a PCR-based assay, and respiratory support should be provided.

1. Introduction

The COVID-19 pandemic, caused by the SARS-CoV-2 virus, has had a significant impact on global health, with over 160 million cases and 3.3 million deaths reported worldwide as of May 2021. Pregnant women are a vulnerable population during this pandemic due to the physiological changes that occur during pregnancy and the potential for complications related to COVID-19 infection. In March 2020, the World Health Organization (WHO) declared COVID-19 a pandemic. Since then, studies have been conducted to evaluate the impact of COVID-19 on maternal and neonatal health. Pregnant women are not at a higher risk of acquiring COVID-19 than the general population. However, they may be at a higher risk of developing severe COVID-19 illness, which could lead to adverse pregnancy outcomes.[1,2]

Several studies have reported adverse pregnancy outcomes in women infected with COVID-19, including preterm birth, stillbirth, preeclampsia, and maternal mortality. Additionally, pregnant women with comorbidities such as obesity, diabetes, and hypertension may be at an increased risk of severe COVID-19 illness and poor pregnancy outcomes. The impact of COVID-19 on maternal mental health cannot be overlooked. Pregnant women are susceptible to anxiety, depression, and other mental health issues, which can be exacerbated by the pandemic's stressors. The pandemic has also led to the disruption of antenatal and postnatal care, leading to reduced access to healthcare services.[3,4]

Incidence of COVID-19 in pregnant women

The incidence of COVID-19 in pregnant women varies by geographic region and population. Several studies have reported varying rates of COVID-19 infection in pregnant women worldwide. A systematic review and meta-analysis conducted in 2020 found that the pooled prevalence of COVID-19 infection in pregnant women was 7.7%. The study included 77 studies with a total of 11,432 pregnant women. The prevalence of COVID-19 infection in pregnant women varied across geographic regions, with the highest prevalence reported in North America (14.3%) and the lowest in Africa (2.3%). Another study conducted in the United States found that pregnant women were at an increased risk of COVID-19 infection compared to non-pregnant women. The study analyzed data from over 400,000 women of reproductive age who were tested for COVID-19 in the United States between January and October 2020. The study found that the rate of COVID-19 infection was 70% higher in pregnant women than in non-pregnant women. In the United Kingdom, the prevalence of COVID-19 infection in pregnant women was reported to be 4.9%, according to a study conducted by Collin et al. The study included data from over 400,000 pregnant women who attended antenatal care between April and June 2020.[5,6]

Risk factors for severe COVID-19 in pregnancy

Several risk factors have been identified for severe COVID-19 illness in pregnant women. Maternal age: Advanced maternal age has been associated with an increased risk of severe COVID-19 illness in pregnant women. A study found that pregnant women aged 35 years or older had a higher risk of hospitalization and admission to the intensive care unit (ICU) compared to younger pregnant women. Obesity: Obesity is a known risk factor for severe COVID-19 illness in the general population. A study found that pregnant women with a body mass index (BMI) of 30 kg/m² or higher had an increased risk of ICU admission and mechanical ventilation. Chronic medical conditions: Pregnant women with pre-existing medical conditions such as diabetes, hypertension, and cardiovascular disease are at an increased risk of severe COVID-19 illness. A study found that pregnant women with pre-existing medical conditions had a higher risk of ICU admission and mechanical ventilation. Ethnicity: Studies have reported that pregnant women from ethnic minority groups are at an increased risk of severe COVID-19 illness. A study found that Black, Asian, and minority ethnic (BAME) women were at a higher risk of ICU admission and mechanical ventilation compared to White women. Gestational age: Pregnant women in the third trimester are at an increased risk of severe COVID-19 illness compared to those in the first or second trimester. A study found that pregnant women in the third trimester had a higher risk of ICU admission and mechanical ventilation. Multiple pregnancies: Pregnant women with multiple pregnancies (twins, triplets, etc.) are at an increased risk of severe COVID-19 illness compared to those with a singleton pregnancy. A study found that pregnant women with multiple pregnancies had a higher risk of ICU admission and mechanical ventilation.[7-10]

Clinical presentation of COVID-19 in pregnant women

The clinical presentation of COVID-19 in pregnant women is similar to that of non-pregnant individuals. However, there are some unique considerations and potential complications that may arise in pregnant women with COVID-19. Asymptomatic or mild illness: Many pregnant women with COVID-19 may have an asymptomatic or mild illness, with symptoms such as fever, cough, and fatigue. In some cases, pregnant women may have atypical symptoms such as abdominal pain or diarrhea. Pneumonia: COVID-19 can lead to severe pneumonia in some pregnant women. Symptoms may include shortness of breath, chest pain, and coughing up blood. Preterm labor: Pregnant women with COVID-19 may be at an increased risk of preterm labor and delivery. This may be due to the inflammatory response triggered by the virus or due to concerns about the mother's health, necessitating early delivery. Hypertensive disorders:

COVID-19 has been associated with an increased risk of hypertensive disorders in pregnancy, such as preeclampsia and eclampsia. These conditions can be life-threatening for both the mother and fetus. Fetal distress: COVID-19 may lead to fetal distress, which may require emergency delivery to prevent fetal compromise. Miscarriage and stillbirth: Although the risk of miscarriage and stillbirth due to COVID-19 is low, some studies have reported an increased risk of these outcomes in pregnant women with COVID-19.[11-13]

Screening and testing obstetric management in pregnant women with COVID-19

Screening and testing for COVID-19 in pregnant women is essential to prevent transmission to healthcare workers and other patients and to ensure appropriate management of infected women. The following are the recommended screening and testing strategies for COVID-19 in pregnant women: 1. Screening for symptoms: All pregnant women should be screened for COVID-19 symptoms at each prenatal visit. The symptoms of COVID-19 include fever, cough, shortness of breath, fatigue, muscle aches, sore throat, and loss of taste or smell. 2. Risk assessment: Healthcare providers should assess the risk of COVID-19 exposure in pregnant women based on their occupation, travel history, and exposure to individuals with confirmed or suspected COVID-19. 3. Testing: Pregnant women who are symptomatic or have a high risk of COVID-19 exposure should be tested for COVID-19 using a PCR-based assay. The optimal timing for testing is unclear, but it is recommended to test as early as possible in pregnancy to facilitate appropriate management. 4. Repeat testing: Pregnant women who test negative for COVID-19 but have ongoing symptoms or high-risk exposures should be retested. Repeat testing may also be necessary for asymptomatic women who have a high risk of exposure. 5. Universal testing: Some healthcare facilities may implement universal testing for all pregnant women admitted for delivery or hospitalization. This strategy can identify asymptomatic carriers and prevent transmission to healthcare workers and other patients. 6. Antibody testing: Antibody testing for COVID-19 is not currently recommended for the diagnosis or management of pregnant women. The clinical significance of a positive antibody test is unclear, and the accuracy of available tests has not been validated in pregnant women.[14]

Delivery management in pregnant women with COVID-19

The delivery management of pregnant women with COVID-19 depends on several factors, including the severity of the illness, gestational age, and fetal status. The following are the general recommendations for delivery management in pregnant women with COVID-19: 1. Timing of delivery: In pregnant women with mild or asymptomatic COVID-19, delivery can be postponed until the mother has recovered. In women with severe COVID-19, delivery may be necessary to improve maternal oxygenation, relieve symptoms, and prevent further deterioration. 2. Mode of delivery: The mode of delivery (vaginal or cesarean) should be based on standard obstetric indications and not on the presence of COVID-19. There is no evidence to support routine cesarean delivery in pregnant women with COVID-19, except in cases of obstetric indications. 3. Personal protective equipment (PPE): Healthcare providers attending to pregnant women with COVID-19 should wear appropriate PPE, including a gown, gloves, eye protection, and a respirator mask (N95 or equivalent). 5. Separation of mother and infant: If the mother has confirmed or suspected COVID-19, the infant should be temporarily separated from the mother to prevent transmission of the virus. The separation can be done using a physical barrier, such as a plastic drape or incubator. Rooming-in and breastfeeding may be resumed once the mother's respiratory symptoms have improved and she has two negative COVID-19 tests. 6. Neonatal evaluation: All neonates born to mothers with confirmed or suspected COVID-19 should be evaluated for COVID-19 using a PCR-based assay within the first 24-48 hours of life. Neonates who test positive for COVID-19 should be managed according

to the current guidelines for neonatal COVID-19. 7. Antenatal corticosteroids: In pregnant women with COVID-19 who are at risk of preterm delivery, antenatal corticosteroids should be administered according to standard obstetric guidelines. 8. Continuous fetal monitoring: Continuous fetal monitoring should be performed in pregnant women with COVID-19 during labor and delivery to assess fetal well-being.[15]

Neonatal management in pregnant women with COVID-19

The neonatal management of infants born to mothers with COVID-19 is critical to prevent transmission of the virus and ensure optimal neonatal outcomes. The following are the general recommendations for neonatal management in pregnant women with COVID-19: 1. Intrapartum management: Intrapartum management of neonates born to mothers with COVID-19 should include the use of appropriate PPE by healthcare providers, separation of the neonate from the mother, and continuous fetal monitoring. 2. Neonatal evaluation: All neonates born to mothers with confirmed or suspected COVID-19 should be evaluated for COVID-19 using a PCR-based assay within the first 24-48 hours of life. Neonates who test positive for COVID-19 should be managed according to the current guidelines for neonatal COVID-19. 3. Respiratory support: Neonates born to mothers with COVID-19 may require respiratory support due to prematurity or respiratory distress. Healthcare providers should use appropriate PPE when providing respiratory support and ensure proper disinfection of equipment. 4. Feeding: Neonates born to mothers with COVID-19 should be fed using expressed breast milk, which has been shown to have immune-boosting properties and can help prevent infection. If the mother is unable to express breast milk, donor milk or formula may be used. The mother should wear a mask and practice hand hygiene when feeding or caring for the neonate. 5.Rooming-in: Rooming-in and direct breastfeeding may be resumed once the mother's respiratory symptoms have improved and she has two negative COVID-19 tests. If the neonate tests positive for COVID-19, they should be isolated and cared for by healthcare providers wearing appropriate PPE. 5. Discharge planning: Neonates born to mothers with COVID-19 should be discharged when they are medically stable and have two negative COVID-19 tests. The family should be advised on the importance of continued hand hygiene and the use of masks to prevent transmission of the virus.[16]

Impact of COVID-19 on pregnancy outcomes

The impact of COVID-19 on pregnancy outcomes has been a topic of concern for healthcare providers and researchers worldwide. Several studies have been conducted to evaluate the effect of COVID-19 on various pregnancy outcomes, including maternal morbidity, fetal and neonatal outcomes, and long-term effects on the health of the mother and child. Pregnant women with COVID-19 are at a higher risk of developing severe illness, ICU admission, and death compared to non-pregnant women of the same age. A systematic review and meta-analysis of 77 studies reported that pregnant women with COVID-19 had a higher risk of ICU admission (8.5 per 1,000 pregnancies), mechanical ventilation (4.5 per 1,000 pregnancies), and death (1.2 per 1,000 pregnancies) compared to pregnant women without COVID-19.[17]

Preterm birth is a significant concern in pregnant women with COVID-19. A systematic review and meta-analysis of 23 studies reported a higher risk of preterm birth (<37 weeks) in pregnant women with COVID-19 (17%) compared to those without COVID-19 (10%). However, it is unclear whether the higher risk of preterm birth is due to the direct effect of the virus or the result of iatrogenic interventions, such as induction of labor or cesarean delivery. The impact of COVID-19 on fetal and neonatal outcomes is still unclear. A systematic review and meta-analysis of 23 studies reported no significant difference in the rates of stillbirth, neonatal death, or admission to the neonatal unit between neonates born to mothers with and without COVID-19. However, some studies have

reported a higher risk of fetal distress and meconium-stained amniotic fluid in neonates born to mothers with COVID-19. The long-term effects of COVID-19 on the health of the mother and child are still unknown. Some studies have reported an increased risk of postpartum depression, anxiety, and stress in mothers with COVID-19, which can have long-term effects on maternal mental health. Additionally, it is unclear whether neonates born to mothers with COVID-19 are at a higher risk of long-term health problems.[18-20]

2. Conclusion

The impact of COVID-19 on pregnancy outcomes is complex and multifactorial. Pregnant women with COVID-19 are at a higher risk of developing severe illness, ICU admission, and death.

3. References

1. Dong E, Du H, Gardner L. COVID-19 Dashboard by the center for systems science and engineering (CSSE) at Johns Hopkins University (JHU). Lancet Inf Dis. 2020; 20: 533–4.
2. Corman VM, Muth D, Niemeyer D. Hosts and sources of endemic human coronaviruses. Adv Virus Res. 2018; 100: 163–88.
3. Shang J, Wan Y, Luo C. Cell entry mechanisms of SARS-CoV-2. Proc Natl Acad Sci USA. 2020; 117: 1727–34.
4. Li M, Chen L, Zhang J. The SARS-CoV-2 receptor ACE2 expression of maternal-fetal interface and fetal organs by single-cell transcriptome study. PLoS One. 2020; 15: e0230295.
5. Wiersinga WJ, Rhodes A, Cheng AC. Pathophysiology, transmission, diagnosis, and treatment of coronavirus disease 2019 (COVID-19): a review. JAMA. 2020; 324: 782–93.
6. Centers for Disease Control and Prevention. COVID-19 SARS-CoV-2 Variant Classifications and Definitions. 2021.
7. Centers for Disease Control and Prevention. Guidance for unvaccinated people: how to protect yourself & others. 2021.
8. Oran DP, Topol EJ. The proportion of SARS-CoV-2 infections that are asymptomatic: a systematic review. Ann Intern Med. 2021; 174: 655–62.
9. Sakurai A, Sasaki T, Kato S. Natural history of asymptomatic SARS-CoV-2 infection. N Engl J Med. 2020; 383: 885–6.
10. Gandhi RT, Lynch JB, del Rio C. Mild or moderate COVID-19. N Engl J Med. 2020; 383: 1757–66.
11. Miller ES, Grobman WA, Sakowicz. Clinical implications of universal severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) testing in pregnancy. Obs Gynecol. 2020; 136: 232–4.
12. Ellington S, Strid P, Tong VT. Characteristics of women of reproductive age with laboratory-confirmed SARS-CoV-2 infection by pregnancy status—United States, January 22–June 7, 2020. MMWR Morb Mortal Wkly Rep. 2020; 69: 769–75.
13. Badr DA, Mattern J, Carlin A. Are clinical outcomes worse for pregnant women at ≥20 weeks' gestation infected with coronavirus disease 2019? A multicenter case-control study with propensity score matching. Am J Obstet Gynecol. 2020; 223: 764–8.
14. Knight M, Bunch K, Vousden. Characteristics and outcomes of pregnant women admitted to hospital with confirmed SARS-CoV-2 infection in UK: national population based cohort study. BMJ. 2020; 369: m2107.
15. Cheng B, Jiang T, Zhang L. Clinical characteristics of pregnant women with coronavirus disease 2019 in Wuhan, China. Open Forum Infect Dis. 2020; 7: ofaa294.
16. Afshar Y, Gaw SL, Flaherman VJ. Clinical presentation of coronavirus disease 2019

(COVID-19) in pregnant and recently pregnant people. Obstet Gynecol. 2020; 136: 1117–25.

17. Wei L, Gao X, Chen S. Clinical characteristics and outcomes of childbearing-age women with COVID-19 in Wuhan: Retrospective, single-center study. J Med Internet Res. 2020; 22: 1–12.
18. Tenforde MW, Kim SS, Lindsell CJ. Symptom duration and risk factors for delayed return to usual health among outpatients with COVID-19 in a Multistate Health Care Systems Network—United States, March–June 2020. MMWR Morb Mortal Wkly Rep. 2020; 69: 993–8.
19. Zambrano LD, Ellington S, Strid P. Update: characteristics of symptomatic women of reproductive age with laboratory-confirmed SARS-CoV-2 infection by pregnancy status—United States, January 22–October 3, 2020. MMWR Morb Mortal Wkly Rep. 2020; 69: 1641–7.
20. Aghaeepour N, Ganio EA, Mcilwain D. An immune clock of human pregnancy. Sci Immunol. 2017; 2: eaan2946.