

Pregnancy, Parturition and Pandemic: A Review

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ABSTRACT

Coronavirus disease 2019 (COVID-19) is a major public health concern, highly contagious in nature and/or causing high mortalities. This review paper reveals comprehensive interpretations of current COVID-19 reports and their impact on pregnancy in conjunction with antenatal visits, mental health, and mode of delivery. We further review recent guidelines of distinct leading organizations, which intend to serve as assistance in managing pregnant women with suspected or confirmed COVID-19. Pregnancy amid the COVID-19 pandemic necessitates marked importance deliberating high-risk status and vulnerability to severe COVID-19 related illnesses. The risk of vertical transmission is low; however, neonatal illness varies from asymptomatic to mildly symptomatic. Healthcare providers should consider proper guidance and obvious illustration of preventive strategies to limit the further spread of COVID-19. We also discuss the safety and efficacy of COVID-19 vaccines in pregnant women, besides benefiting both mother and baby.

Keywords: COVID-19, Maternal Morbidity, Intranatal, Newborn, Breastfeeding with COVID-19, Vaccination



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Introduction

Novel coronavirus disease 2019 (COVID-19) is an infectious disease caused by a virus named severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2); it had a devastating effect on human health across the world, declared by the World Health Organization (WHO) as a pandemic on March 11, 2020 (1). The pandemic has resulted in more than 156 million infections and more than 3 million deaths as of May 4, 2021 (2).

A major concern in the management of any infectious disease is the protection of vulnerable populations. Pregnant women are regarded as a high-risk group regarding the consequences of COVID-19 on pregnancy and neonatal outcomes (3). According to the Centers for Disease Control and Prevention (CDC), pregnant and recently pregnant women were at accelerated risk to receive hospitalization, intensive care, and invasive ventilation compared with non-pregnant women (4). The physiological changes occurring during pregnancy and immaturity of the adaptive immune system make pregnant women and their fetuses highly vulnerable to viral infections (5). According to the Guttmacher Institute, a slight drop of 10% in coverage of pregnancy and neonatal-related

health care could result in more maternal (28,000) and neonatal (1,68,000) deaths (6).

Accordingly, we aimed to thoroughly review the details of this pandemic and its impact on pregnancy outcomes, as well as to present the prevalence of maternal and neonatal mortality and morbidity amidst the pandemic.

Search Strategy

An extensive literature review was conducted by searching various databases, i.e., PubMed, Scopus, Web of Science, Google Scholar, Obstetrics and Gynecology organizations, and grey literature. We also screened the reference lists of selected articles to find out other relevant articles or studies. Selected literature was assessed, and findings were synthesized and included in this review article.

Prevalence of COVID-19 Among Pregnant Women

Researchers at Massachusetts General Hospital prepared data on the prevalence of COVID-19 in pregnant women; 18 days of comprehensive testing in labor and delivery units indicated the lower prevalence of COVID-19 in asymptomatic pregnant women compared with symptomatic pregnant women (7).

Another study examined data brought by the Indian Council of Medical Research–National Institute for Research in Reproductive Health (ICMR-NIRRH) among 1,140 pregnant women, 321 tested positive for COVID-19. Yet, only 37 (11.5%) were symptomatic when they were admitted to the hospital for delivery. Consequently, results showed the presence of one symptomatic to every nine asymptomatic pregnant women and varied prevalence (0%–40%) of the virus in women in different hospitals (8).

Pregnant women with COVID-19 in the third trimester are more likely to require critical care, and it is thought that viral infections may increase the risk of obstetric and perinatal complications, as a recent systemic review showed that COVID-19 in pregnancy was correlated with preeclampsia, preterm birth, and stillbirth (8).

Impact of COVID-19 on Antenatal Visits, Mental Health, and Mode of Delivery

Antenatal care (ANC) visits are crucial for both maternal and fetal health. However, during the pandemic, these hospital visits increase the risk of COVID-19 infection in mothers and their fetuses (9). Accordingly, the number of ANC visits was reduced to approximately 80%. Some measures by the government (such as social distancing, national lockdown, and quarantine) may make it difficult for women to attend ANC sessions. According to a model studied in the Asia-Pacific region, a 20% drop in sexual and reproductive health services resulted in a 17% rise in maternal mortality. A delay in obstetric investigations, such as ultrasonography (USG), can negatively affect maternal and fetal outcomes (10). The International Federation of Gynecology and Obstetrics (FIGO) recommends that the face-to-face visits during pandemics should be reduced, and appointments should be made through the telephone or video conferencing if possible and appropriate (11).

The antenatal period is generally escorted by maternal psychological distress, which negatively impacts fetal well-being and childbirth outcome. Apart from the anxiety due to pregnancy, there are some additional risk factors correlated with tremendous fear and anxiety prevalence during pregnancy entailing COVID-19 pandemic, duly COVID-19 anxiety would additionally be determined as a leading factor in the mental health of pregnant women (12). The prevalence rate of anxiety in pregnancy has doubled (13). A recent study estimated that about 21% of pregnant women go through pregnancy-related anxiety (PrA), and the number of pregnancies, practices regarding COVID-19, COVID-19 anxiety, depression, and social assistance were significant anticipators of PrA amid the COVID-19 pandemic (14).

Studies have indicated that the cesarean section rate increases among pregnant women infected with COVID-19 (15). This increase suggests that obstetricians attempt to provide the best care possible

and safest mode of delivery to their patients; even many pregnant women choose cesarean section due to concern for fetal health (16). A recent study in Italy reported data of 42 pregnant women estimated the cesarean section rate of 42.9%, of whom 8 had cesarean sections for a reason unrelated to COVID-19; the vaginal delivery rate was 57% (17).

Furthermore, COVID-19 is concerned as a usual indication for cesarean section though management guidelines are against this; however, this was the mode of delivery in the majority of cases with fetal distress as the consideration behind the clinical decision (16). WHO advised the cesarean section to perform only when medically justified and to individualize the mode of delivery based on women's preference besides obstetric indication to reduce the rate of avoidable, unintended cesarean section (18).

Newborn Outcomes During COVID-19

Certain details about neonates born to mothers with suspected or confirmed COVID-19 infection have been studied in recent studies. Some evidence showed that 1 in 4 of all neonates born to mothers with COVID-19 received neonatal intensive care; however, stillbirth and the neonatal death rate were low (3). Currently, the degree to which mother-to-child transmission of SARS-CoV-2 occurs is unknown but probable (19). In a cohort study by Zhu *et al.*, it was indicated that 9 of 10 neonates born to mothers with COVID-19 exhibited shortness of breath, cyanosis, vomiting, and feeding intolerance, fever, increased heart rate, moaning, and rashes. Two of them had thrombocytopenia conveyed by abnormal liver function; one of them died on account of gastric bleeding and shock eventuating in multiple organ failure and disseminated intravascular coagulation. Markedly, none of these newborns tested positive for COVID-19 (20).

The management of neonates with COVID-19 depends on a significant amount of respiratory support, oxygen, fluid, and electrolyte therapy, and empiric antibiotics if there is bacterial coinfection; however, remdesivir use in neonates is not approved by FDA. Moreover, studies have shown no evidence of SARS-CoV-2 in amniotic fluid, umbilical cord blood, neonatal throat swabs, or breast milk samples. Vertical transmission was negative in all neonates (21).

Morbidity and Mortality Among Pregnant women with COVID-19

Pregnant women with COVID-19 are more likely to have comorbidities and even death from the virus (3). A multinational cohort study of 2,130 pregnant women in 18 countries (in which a total of 702 pregnant women were diagnosed with COVID-19) indicated that pregnant women with COVID-19 were at higher risk for preeclampsia or eclampsia, severe infection, intensive care admission, maternal mortality, preterm birth, and severe perinatal morbidity and mortality index compared to those without COVID-19. Convincingly, COVID-19 in pregnancy was related to

a consistent and actual increase in brutal maternal morbidity and mortality (22). The National Institute of Child Health and Human Maternal-Fetal Medicine Unit Network indicated a higher rate of hostile perinatal outcomes along with increased severity of maternal COVID-19 disease in pregnant women (23); studies have also shown that pregnant women are 20 manifolds more likely to succumb from COVID-19 than those without COVID-19 (24); thus it is necessary to take preventive measures to keep these women away from infection during pregnancy (9).

Intranatal Including Breastfeeding Interventions to Combat COVID -19 Pandemic

In the context of intranatal care, personal protective equipment (PPE) should be used under hospital conditions for suspected or confirmed COVID-19 patients (25). An interdisciplinary care coordination, including maternal-fetal medicine, infectious disease, clinical care, obstetric anesthesia, and neonatology, must be involved (26). The first set of recommendations necessitates discretion against corticosteroid administration, specifically in critically ill COVID-19 patients. Respiratory analgesia (nitrous oxide) is not favored by the Spanish Ministry of Health in COVID-19 patients due to the likelihood of aerosol propagation (27). A recent meta-analysis has reported that intrapartum oxygen has no fetal benefit and may cause harm and increase the chances of disease spread or exposure between patients and healthcare providers (28). Nearly all leading guidelines are recommended in opposition to delayed cord clamping in suspected or positive COVID-19 women, except for Royal College of Obstetricians and Gynaecologists (RCOG) and the Spanish Ministry of Health (27).

Contemplating the insufficiency of authenticity for SARS-COV-2 transmission over breast milk, WHO recommended the initiation and continued breastfeeding of infants and young children also for mothers with suspected or positive COVID-19 (29). The outcomes of not breastfeeding and separation between mother and child can be noteworthy as per Chinese expert consensus, while other regulating organizations endorse the welfare of breastfeeding and mother-infant interaction to hinder infection and promote health and development (27). Also, it overshadowed the likely limited risk of maternal to newborn transmission mainly in the account of low virulence within a neonatal population. Specific hygiene measures must be taken into account when direct breastfeeding is advocated (30).

Prevention of COVID-19

Provisional COVID-19 guidelines are currently available from CDC and WHO for effective counseling and education of pregnant women. Pregnant women should be well-informed about the potential risk of COVID-19 and preventive measures to lower the severity of COVID-19 associated illness (31). Pregnant women are encouraged to take all measures to avoid

becoming infected with COVID-19, including frequent handwashing, restricting interaction with individuals and public assemblies, abstaining imprudent outside activities if not required, maintaining antenatal care visits, maintaining social distancing, wearing a mask and others suggested PPEs, check their temperature regularly and inform their doctor if they exhibit cough, fever, or shortness of breath.

Moreover, WHO recommended isolating women with travel history or COVID-19 symptoms for at least 14 days (27, 32). Telehealth prenatal appointments to be provided by maternity units in case confronting consultation is needless after a telephone consultation to maintain good pregnancy health. Online antenatal care programs (such as online courses for pregnancy-related information and mobile phone applications for psychological consultation and healthy practices during pregnancy) provide necessary antenatal care at home itself. Consequently, pregnant women without any significant issues should use online antenatal care programs as a substitute for ANC visits in hospitals (9, 33).

COVID-19 Vaccination in Pregnant Women

COVID-19 vaccines forthwith sanctioned by Food and Drug Administration (FDA) have no obligations to restrain pregnant women who prefer to get a vaccine (34). The newest recommendation from the Joint Committee on Vaccination and Immunization (JCVI) as of April 16, 2021, is that COVID-19 vaccines should be provided to pregnant women simultaneously as the remaining population according to their age and clinical risk group. Breastfeeding should not be stopped in order to get vaccinated against COVID-19 (35). WHO claims that they are devoid of any grounds to consider the particular risk that would overwhelm the benefits of vaccination in pregnant women. However, there are bounding details concerning the effect of COVID-19 vaccination in pregnancy (36). Data from the US, where about 90,000 pregnant women were vaccinated specifically with mRNA vaccines (including Pfizer and Moderna), did not report any issues. Accordingly, JCVI advised preferring Pfizer or Moderna vaccines for pregnant women where available. Currently, in India, vaccination is not recommended for pregnant women (37).

Conclusion

COVID-19 has become a major issue for pregnant women. Antenatal care amid the COVID-19 pandemic is inquisitive; howbeit vital, thereupon ensuing web-based antenatal care can be beneficial as a possible alternative for pregnant women to curb unneeded hospital visits. Healthcare providers should pay special attention to the mental health of pregnant women during pandemics. Symptomatic pregnant women may have more severe maternal outcomes and higher rates of perinatal morbidity and mortality. Vertical transmission of COVID-19 is rare. Newborns seem to

be at low risk of COVID-19, may experience mild symptoms. Adjoining suggestions from distinct leading organizations can aid clinicians and midwives in offering the best possible care to pregnant women and their newborns. Counsel pregnant women about hygienic breastfeeding and take preventive measures to prevent the further dissemination of disease.

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Conflict of Interest

The authors declared no conflict of interest.

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