New corona virus and pregnancy; what should obstetricians know?

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Abstract

COVID-19 the disease caused by a new coronavirus has quickly raised the world concern by spreading globally at an accelerated rate and is considered now a pandemic, according to the World Health Organization. However, data regarding the situation of pregnant women with COVID-19 infection is still very scanty.

The pregnant women are considered a unique challenge during the COVID-19 pandemic and several questions about pregnant women and their newborns are not answered yet, whether they will develop distinct symptoms from non-pregnant patients and the ability of COVID-19 to spread vertically which may add more threats to the fetus and neonate. Previous studies have shown a higher fatality rate among pregnant women with SARS and MERS when compared with the available data regarding COVID-19 with pregnancy.

The aim of the current review is to highlight the vague points of COVID-19 infection during pregnancy, taking into consideration the clinical dilemma, diagnostic challenges and paying much attention to all adverse pregnancy outcomes such as intrauterine infection, maternal-fetal complications, and therapeutic controversies.

Keywords: COVID-19, pregnancy, maternal outcome, vertical transmissions, fetal outcome, therapeutic controversies.

Introduction

New coronavirus (COVID-19) is the world's most popular name and it is the focus of the interest of many scientists, researchers, politicians, and general people worldwide especially because of the surprisingly increasing burden of the disease (1).

Since December 2019, in Wuhan, China was the initial focus of a viral outbreak, rapidly many cases have been diagnosed in Italy, Iran, South Korea, Spain then globally (2, 3) and the WHO 11TH March 2020 announced the occurrence of a pandemic with the expected peak around April – May 2020 (4). Coronaviruses are viruses with various disease verities, ranging from flu-like symptoms to serious diseases, COVID-19 disease caused by the novel coronavirus which is a new strain of enveloped RNA coronavirus (1, 5), "severe acute respiratory syndrome coronavirus 2" (SARS-CoV-2). Such strain was not previously reported in humans.

The high infectivity of the new strain is due to proven transmission of the virus between individuals through inhaling airborne droplets from symptomatic or asymptomatic persons who cough, sneeze, or touch contaminated surfaces (6, 7, 8) and life-threatening consequences could have happened

especially among the vulnerable group of patients with comorbidities (9).

During pregnancy, the maternal immune system is adapted to tolerate the growing fetus leaving the mother vulnerable to infections (10), which raises questions regarding the impact of COVID- 19 infection during pregnancy.

At present, very limited data is available regarding the epidemiology, clinical features, and treatment modalities of COVID-19 during pregnancy (11). Furthermore, little is known regarding the best mode of delivery, post-natal care, and the impact of breastfeeding.

The aim of the current review is to highlight the vague points of COVID-19 infection during pregnancy, taking into consideration the clinical dilemma, diagnostic challenges and paying much attention to all adverse pregnancy outcomes such as intrauterine infection, maternal-fetal complications, and therapeutic controversies.

Clinical dilemma and maternal outcomes

COVID-19 disease is a universally spreading infectious disease affecting all age groups particularly those with lower immunity such as elderly people with associated comorbidities, However, the effect of COVID-19 on pregnant women is not well studied yet (12, 13), all data available in the literature are based on past reports of same family coronaviruses (SARS-CoV and MERS-CoV) with a substantial risk of severe maternal and neonatal illness (14).

Pregnancy is a special situation characterized by physiological, anatomical, hormonal and immunological changes to maintain the growing allogenic fetus, however, such physiological changes render the mother more prone to severe infections (15), immunological changes include the alteration in cell-mediated immunity which increases the maternal vulnerability to intracellular organisms like viruses (16), in addition to the anatomical changes which decrease the maternal tolerance to hypoxia (17). Furthermore, estrogen-mediated upper respiratory congestion that affects half of the pregnant ladies in the late trimester and usually presents with rhinitis and mild upper respiratory tract infection. These symptoms may simulate the symptoms of COVID-19 infection (18), which adds more challenges on the way of diagnosis of COVID-19 during pregnancy.

Suspected pregnant women with COVID-19 infection are usually presented with clinical symptoms varying in severity from the common cold to severe respiratory illness and death, the clinical characteristics of overwhelming COVID-19 pregnant women were similar to infected non-pregnant women, common manifestations such as nausea, malaise, exhaustion, myalgia, dry cough and shortness of breath, others may present with nasal congestion, runny nose, sore throat, hemoptysis or diarrhea may be present. Infection of the respiratory tract may include mild pneumonia or severe pneumonia with marked respiratory distress (4, 5). Asymptomatic patients who were positive for the virus at admission (19) represent a significant commitment to illness spread and a major threat to health care providers (20). Early studies suggest that in 17-29% of hospitalized cases, the incidence of acute respiratory distress (ARDS) occurs at approximately 1%.

The laboratory results of pregnant women with COVID-19 infection show normal white blood cells or even leucopenia at early stages, lymphopenia, and thrombocytopenia. While, liver enzymes, C-reactive

protein, and creatine phosphokinase may be increased (21).

Chest computed tomography (CT) scans without contrast is a very useful imaging modality to confirm or rule out viral pneumonia and should be implemented in all suspected pregnant women with COVID-19 infection, radiologic signs revealed bilateral, multi-lobar ground-glass opacities or consolidation which show the underlying vessels (21,22). Chest imaging may aid but not replace molecular confirmation of COVID-19. A recent study showed that chest CT sensitivity was greater in diagnosing COVID 19 than RT RCR 98% vs 71%. (25). Viral isolation is considered to be the gold standard to test COV 2 SARS using RT PCR 23, but the clinical problem is the false-negative detection of nuclear acid (23) and thus makes the imaging examination crucial. Also, hospital isolation practices may be extremely influenced by the strategy of universal testing and detecting Covid-19 status (24).

Fetal outcome

Previous studies have shown that the risk of adverse neonatal results including accidental abortion, premature labor, and intrauterine growth retardation, and endotracheal intubation, admission to neonatal intensives, renal failure, and DIC are highly significant when the pregnant women become infected with SARS and MERS. (26).

However, the predicted neonatal outcomes of pregnant women with COVID19 infection were likely to be less severe than estimated for those with MERS-CoV or SARS CoV infection (27).

Despite the limited data available about the effects of COVID-19 on pregnancy, higher risk for preterm delivery was reported in 47% of cases (18), miscarriage in 2% and IUGR in 10% of cases, in addition to other obstetric complications such as preeclampsia, premature rupture of membranes, irregular uterine contractions and stillbirth, However, it is not evident that such outcomes were causally related to COVID-19 infection, and further studies are needed (28, 29). The risk of congenital abnormalities has not risen due to the mother's fever. (34). the theoretical risk of vertical transmission of COVID-19 in infected mothers is still concerned (32, 33) despite big evidence from literature against the probability of such a way of transmission (28, 29, 30, 31).

Management of pregnant women with COVID-19

The protocol of management of a pregnant woman with COVID-19 should be individualized according to disease severity and the trimester of their pregnancy (35), risk stratification of every case should be done and patients are classified into three degrees, either mild in which the patient is vitally stable or severe in which the respiration rate is ≥30/min, resting SaO2 is ≤93% and arterial blood oxygen partial pressure (PaO2)/ oxygen concentration (FiO2) is ≤300 mmHg or critical in which the patient is shocked with multi-organ failure, mechanical ventilation indicated in those with respiratory failure, severe hypoxia may require oxygenation through the extra-corporal membrane. Such categories are based on clinical evaluation (22), the early detection and intervention of pregnant cases with COVID-19 may improve pregnancy outcomes (28) by reducing the probability of obstetric complications such as pregnancy loss, fetal growth retardation, and preterm labor.

Regarding the use of anti-viral drugs for coronavirus during pregnancy, there is no worldwide consensus concerning any specific antiviral drugs

for COVID-19 pneumonia and such treatment can be initiated during pregnancy, according to risk-benefit ratio to the fetus. A recent study recommends the use of lopinavir/ritonavir for such cases as safe with pregnancy. (22), similarly, corticosteroids are not generally recommended in COVID-19 pneumonia with pregnancy except in cases with ARDS, however, if it is required in cases of preterm labor to enhance fetal lung maturity, intramuscular betamethasone injections can be given.

According to available data, breastfeeding can be allowed in patients who are physically good and can tolerate breastfeeding; and who became noninfectious. The length of separation cannot be accurately estimated with the available knowledge and should be decided on an individual basis after a conversation between immunologists, infection control experts, and neonatologists (14). It is worth mention that mothers with known or suspected COVID-19 must be strict to standard and contact precautions during breastfeeding (21).

Conclusion

COVID-19 pandemic caused by the novel virus SARS-CoV-2 is a huge problem, threatening all the population groups especially pregnant ladies due to many physiological and immunological changes occurring during pregnancy that render pregnant women more vulnerable to respiratory pathogens and serious pneumonia than others. Their chance to catch COVID-19 infection increases, especially, if they are suffering from other comorbidities.

Up till now, there is no much data regarding the prevalence and clinical features of COVID-19 during pregnancy, childbirth and the postnatal period, however, data from countries with a high number of cases refer to a very low probability of intrauterine transmission of the virus to the fetus from infected pregnant mother.

The physician should adhere to all currently available recommendations, as well as previous experiences from the prevention and control of SARS and MERS and more attempts must be made to protect both mothers and fetuses with the ongoing COVID-19 pandemic. Further studies should be done to cover the outcomes of the first and second trimester of pregnant women infected with COVID-19 and the role of more antiviral drugs in addition to the potential benefits of plasma extraction from the blood of patients who are cured of the virus. Furthermore, the impact of lactation on postnatal immunological development and the probability of neonatal infection should be further estimated.

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