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Research Article

Covid Disease_19 Fetal Health, Consequences and Complications of Pregnancy: A Review Study

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Abstract

Introduction: The emerging corona virus may affect all members of society, including pregnant women, and due to the physiological changes during pregnancy, a pregnant woman and her fetus may be at greater risk for complications of this disease. Therefore, the present review study was performed to investigate the effect of Quaid_19 disease on fetal health, pregnancy outcomes and complications.

Methods: In this study, a review of articles indexed in Persian and Latin databases Magiran, Pub med, Google scholar T Scopus, Embase, Science direct and with keywords 'Coronaviruses, COVID-19, respiratory infection, pregnancy, fetal disorder, Newborn 'Were reviewed and finally 12 articles were reviewed.

Findings: In this study, the pathogenicity of coronavirus and its complications during pregnancy were investigated. Vertical transmission between mother and infant is likely to be negative, and the presence of the virus in amniotic fluid, vaginal secretions and cord blood, breast milk, and the contents of the newborn's stomach has been negative in various studies. But fetal complications are not yet fully understood and require further study and time.

Keywords: *Pregnancy; Covid 19; Infant; Prenatal*

Introduction

The emerging Covid-19 disease, which first occurred in Wuhan City, Hubei Province, China, was declared by the World Health Organization (WHO) on January 30, 2020 as the sixth public health emergency of international concern [1,2]. The disease spread rapidly to other continents, causing large numbers of deaths in a short period of time, and was therefore identified by the World Health Organization as a pandemic disease [2]. The disease can affect everyone in the community, including pregnant women, and can even cause serious complications. Pregnant women are considered a high-risk group; On the one hand, due to immunological and physiological changes, pregnancies are at greater risk for infectious diseases. On the other hand, there is a risk of fetal and neonatal complications. Because of the potential effects of infections, and based on previous experience with SARS, MERS, and the flu, Schwartz noted that pregnant women are more likely than non-pregnant patients to develop severe pneumonia if they have a respiratory infection. Chronic or pregnancy-related illnesses can increase the risk [3-5]. In addition to manifestations of infection, with the risk of maternal and neonatal adverse events, preterm birth, spontaneous abortion, use of endotracheal intubation, intrauterine growth restriction, intensive care unit, renal failure, intravascular coagulation and fetal transfer Or there is a newborn [6]. Current studies on the susceptibility of pregnant women to COVID-19

infection are still very few, although transmission of the virus to the fetus or child during childbirth or pregnancy has not been established [7]. The effect of this infection on pregnancy is not yet known, but it has been shown that pregnant women, especially in the last trimester of pregnancy, can not tolerate severe acute pneumonia, which is evidenced by the disproportionate death of pregnant women during the influenza pandemic [8].

There is still no evidence that pregnant women are more susceptible to COVID-19 infection or severe pneumonia than the general population. The clinical manifestations of SARS-CoV-2 vary from patient to patient, but the most common symptom is pre-existing or even fever. Postpartum, followed by cough, myalgia, weakness, sore throat and shortness of breath, but gastrointestinal symptoms are also observed in one of the cases. Increases fetal growth restriction, prenatal mortality, and low Apgar score in the infant. As the consequences of COVID-19 infection in pregnant women before the third trimester are not known, it is recommended that regular fetal ultrasounds be performed every 2-4 weeks to evaluate the fetus [9]. Zhou., *et al.* Assume that maternal hypoxia due to SARS-CoV-2 can lead to fetal distress or preterm delivery, however, the authors themselves emphasize that this is only speculation due to poor evidence [10] Evidence obtained so far shows that vertical transmission of the corona virus from a pregnant woman to the fetus does not occur [11]. And cord blood and throat swabs for newborns are virus-free. However, it is recommended to use a clear and simple method such as washing the baby early after birth, and separating it from the infected mother, to minimize the risk of infection [12].

There is disagreement about the teratogenic effects of respiratory viruses, but some respiratory viruses have been shown to cause encephalopathy and neural tube defects and are associated with unsafe hydrops and limb disorders, which the coronavirus may also have, but studies are not enough [13].

Another factor affecting pregnancy is the increase in stress and anxiety of the pregnant mother. Anxiety is a common response to any stressful situation. Prevalence of anxiety during pregnancy, in developed and developing countries, is 10 and 25%, respectively [8,14]. Symptoms of anxiety during pregnancy as an independent risk factor for adverse outcomes [15].

Prenatal anxiety may be a risk factor for maternal psychological problems such as increased risk of postpartum depression [16]. Anxiety is the most common mental health problem in Covid-19 pandemic and may have a profound effect on pregnancy anxiety in pregnant women. Because the process of pregnancy and childbirth and the postpartum period are stressful enough in themselves and environmental factors can exacerbate it [8].

Method

The present study is a review study. Search for articles with Coronaviruse, COVID-19, respiratory infection, pregnancy, fetal disorder, Newborn in Magiran, Pubmed, Google scholarT Scopus, Embase, Science direct databases Clinical protocols and reputable global organizations, including the World Health Organization (WHO) and the Centers for Disease Control and Prevention (CDC), were conducted between 2010 and 2021. A total of 52 articles, reports and protocols were found, and by eliminating similar and unrelated issues and citing updated cases, 12 studies were reviewed.

Findings

Pregnant women are prone to severe respiratory illness and pneumonia due to changes in the immune system and respiratory system, which is also possible for Covid 19 infection, especially if they have a chronic illness or pregnancy complications such as high blood pressure. There is evidence that maternal viral infections can also affect pregnancy. Results from previous epidemics of viral infections indicate poor pregnancy outcomes, including maternal morbidity and mortality, maternal-to-fetal virus transmission, and perinatal infections [20].

Similar respiratory viruses and effects on pregnancy

There are more than 200 types of respiratory viruses that can cause colds, pharyngitis, laryngitis, bronchitis and pneumonia [8]. Is. As of August 17, 2015, 1,432 MERS_COV-approved patients were diagnosed with at least 507 deaths worldwide [21-23]. A small number of patients with MERS_COV virus were pregnant women (11 people), of which 91% had adverse clinical symptoms [24] and maternal mortality rate was about 23% [20].

One of them was about a dead baby in a 5-month-old pregnant woman in ordan [25]. The other included a woman in the UAE who had (MERS_COV) who died 3 months after giving birth to a healthy baby without any infection [26].

Another study on the MERS_COV virus in Saudi Arabia by Asiri., *et al.* reported five cases of mother-to-child transmission in the second and third trimesters. All of these mothers needed special care. Two of these mothers lost their lives due to severe illness. One case reported intrauterine fetal death and one infant death shortly after cesarean delivery [27].

Another virus similar to COVID_19 is the SARS virus (SARS-CoV), which reported on the emergence of SARS in February 2003 in China. The virus has spread to nearly 30 countries around the world, causing more than 8,000 cases and 770 deaths. The largest number of pregnant women with SARS was related to an outbreak in Hong Kong in 2003, in which 12 pregnant women were identified [28]. Among five women after 24 weeks of gestation, four had preterm labor. Two infants had respiratory distress syndrome and one infant developed bronchopulmonary dysplasia [29].

Two babies born to SARS after their mothers recovered had intrauterine growth retardation. No clinical, radiological, or laboratory evidence of maternal-fetal transmission was observed despite various laboratory tests [30,31]. In their study, Wang., *et al.* Found that 50 percent of pregnant women with SARS were admitted to the intensive care unit and 25 percent died [32].

A case-control study comparing the effects of SARS on pregnancy in Hong Kong was performed on 10 pregnant women and 40 non-pregnant women with infection [31,20]. Three deaths were reported in pregnant women with SARS (30%) and there were no deaths in the non-pregnant group of infected women. Renal failure and diffuse intravascular coagulation were higher in pregnant women than in the non-pregnant group. Six pregnant women with SARS required admission to the intensive care unit (ICU) (60%) and 4 required intubation (40%), while the rate of intubation in non-pregnant women was 12.5% (0.065). = P) and the admission rate in the intensive care unit was 17.5% [33].

Maxwell., *et al.* Reported 7 pregnant women infected with SARS-CoV, of whom 2 out of 7 died (28%), and 4 (57%) required ICU hospitalization and mechanical ventilation. Two pregnant women with SARS recovered and survived, but their baby had intrauterine growth retardation (IUGR). Among live-born infants, there was no clinical or laboratory evidence of SARS-CoV infection [34].

Gagneur., *et al.* Examined 159 mothers and infants for possible transmission of coronaviruses in humans during pregnancy, and 3 samples of maternal vaginal discharge, respiratory secretions, and gastric samples were taken from newborns. Evaluated. These samples were evaluated using RT-PCR for the presence of HCoV 229E, OC-43, NL63 and HKU1. Coronaviruses were detected in 12 samples (HCoV 229E: 11; HKU1: 1) from 7 mothers and children. In 3 mothers, only the respiratory sample was positive. In both mothers and children, all three samples were positive for human coronavirus. In one case, only the newborn's stomach samples and the mother's vagina were positive. In the other case, the mother's vaginal specimen alone was positive. None of the 3 neonates who tested positive for coronavirus had any signs of clinical infection [35,36].

Influence of respiratory viruses

There is disagreement about the teratogenic effects of respiratory viruses. A cohort study in Finland found that the risk of anencephaly increased by 4 - 5 times in women with colds. Another study in California found that many early pregnancy conditions slightly increased

the risk of neural tube defects. Studies on amniotic fluid in women who underwent amniocentesis were also positive for PCR virus and found to be associated with fetal growth restriction, unsafe hydrops, foot or hand disorders, and neural tube defects. (Adams 2012) Adenoviral infection is a known cause of childhood myocarditis [8].

In some respiratory viral infections, there is a possibility of fetal infection and vertical transmission to the baby. Neonatal infection is associated with miscarriage, unsafe hydrops, and stillbirth, and the most common viral infections that cause these complications are parvoviruses [8]. In the case of the coronavirus family, the risk of miscarriage increases if the mother becomes infected in the first trimester. Unreported vertical transmission [30,31] and common complications of this type of viral infection in various studies including intrauterine growth restriction, preterm delivery, fetal distress, perinatal death, intrauterine death and neonatal death [22-24,26].

Covid virus 19 and pregnancy

According to our knowledge in connection with the study of disease manifestations and consequences of childbirth, so far 12 English studies with full text have been found, of which 4 were original studies [38-42] and were conducted in China. These studies are discussed in detail below. In pregnant women due to weakened immune system and physiological changes of the respiratory system (decreased diaphragm height, increased oxygen consumption, edema of the mucous membranes of the respiratory tract, their tolerance to hypoxia decreases) [43]. Respiratory problems are expected to increase in pregnant women with Covid 19, but studies by researchers in China have shown that the clinical symptoms of pregnant women are not different from those of non-pregnant women [44,45]. At the time of admission and 67% after delivery had a fever. Also, 44% experienced cough, 33% 22% experienced shortness of breath and weakness [46]. Vertical transmission from mother to infant is unclear and the results of studies are in favor of not vertical transmission from mother to fetus and infant. In a study by Chen., *et al.* In China, vertical intrauterine transmission of Covid-19 infection was evaluated in 9 pregnant women with the virus. To evaluate the evidence of vertical intrauterine transfer, amniotic fluid was sampled before delivery and immediately after delivery, cord blood and pharyngeal secretions were sampled and PCR-RT was performed. They did not have the coronavirus. Breast milk samples were also collected and tested from patients after the first breastfeeding, and were negative [43]. The results of a case study by Wang., *et al.* Showed that a mother was hospitalized with suspected coronary heart disease and had a cesarean section due to fetal meconium excretion. The formula was done. Thirty-five hours after birth, the baby's pharyngeal secretions were sampled and the PCR-RT test was positive. However, PCR-RT was negative in breast milk samples, as well as nucleic acid tests in cord blood and placental samples, the authors of the study stated that the vertical transmission of coronavirus from mother to fetus is unknown [46]. Theoretically, respiratory infections in pregnant women increase the risk of preterm birth, fetal growth restriction, perinatal mortality, and low Apgar score in the infant [47]. According to ISUOG guidelines, to prevent the consequences of coronavirus infection (covid-19) in pregnant women with coronavirus, it is recommended to evaluate the fetus with ultrasound within 2 - 4 weeks [48]. In the amniotic fluid test, Chen., *et al.* Of the six women collected, they did not find any [49]. Wang., *et al*. Also tested negative for SARS-COV in a cord blood sample and amniotic fluid [47].

In the case of vertical respiratory transmission of the virus from mother to child, there are three potential patterns: transmission during pregnancy, transmission through the birth canal and during labor, lactation and postpartum [50].

According to Liu., *et al*. Among the nine live births of women infected with SARS-CoV, all scored 10 on a 1-minute Apgar score and there was no clinical or serological evidence for vertical transmission of the virus [51]. *Et al.* Reported that umbilical cord blood swabs and throat swabs from 9 newborns from infected women were all negative, which appears to eliminate the SARSCoV pair [49]. According to a study by Wyong., *et al.* Samples of cord blood, throat swabs and virus-free neonatal blood. They recommend that infants contact the infected mother using a simple and clear method of washing the infant early after birth, and separating it from the mother to prevent infection of the infant [52,53].

The corona virus has not yet been found in breast milk. Therefore, it is recommended for patients with the virus to maintain breast-feeding. The tests performed by Chen., *et al*. For the corona virus in the breast milk of 9 women were all negative [49].

Based on the limited information gathered so far, most researchers recommend breastfeeding, even in small amounts, as a potential and beneficial source of maternal antibodies for the baby. However, Rasmussen., *et al*. Emphasized that, unfortunately, antibodies against coronaviruses are not long-lasting [54-57]. In cases where the mother is infected and breastfeeding is not performed to prevent transmission, the baby should be bottle-fed by a healthy person, or cautiously fed by the mother, who should wear a mask to prevent transmission. Wash his hands thoroughly [56,57].

Conclusion

The results of studies show that transmission during pregnancy and intrauterine is unlikely to occur and pregnancy results in this virus are better than similar viruses and there are no serious complications. However, due to the limited information about the effect of coronavirus on pregnancy and childbirth, it is necessary for pregnant mothers to avoid contracting the virus to maintain their health and that of the child as much as possible by following the health tips and instructions. Health care providers should also provide the necessary advice to pregnant mothers in this regard, because the virus may have serious long-term effects on the health of children in the future, which is still unknown and will be determined over time and the completion of studies. On the other hand, infected pregnant mothers should be under constant supervision, treatment and care to minimize complications and minimize harm to the fetus.

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