



Pregnancy and coronavirus disease

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Dear Editor,

Coronavirus disease 2019 (COVID-19) is an emerging disease. It was first diagnosed in Wuhan, China, rapidly spread throughout the world, and caused many deaths. COVID-19 is a condition characterized by reduced lymphocytes and increased proinflammatory cytokines as found in pregnancy (1). There is limited information about COVID-19 in pregnancy.

Physiological changes in pregnancy, including reduced residual functional capacity, diaphragm elevation, respiratory mucosal edema, and altered cellular immunity, can increase susceptibility to viral infections and pregnancy complications (2). In the first trimester of pregnancy, proinflammatory conditions happen in order to facilitate the implantation of the blastocyst, resulting in altered immunity, fatigue, headache, and weakness. In the second trimester, anti-inflammatory conditions happen in order to promote fetal growth and hence, maternal symptoms decrease. In the third trimester, proinflammatory conditions again happen for facilitating childbirth (1). COVID-19 is an inflammatory disease and hence, can aggravate inflammatory conditions during the first and the third trimesters of pregnancy. Moreover, the angiotensin-converting enzyme 2 (ACE2) can act as the receptor of the coronavirus during the first trimester of pregnancy (3). ACE2 receptors are found in placental cytotrophoblast, syncytiotrophoblast, and deciduas, and hence, the coronavirus can enter host cells through ACE2 receptors and cause COVID-19 (1). In pregnancy and COVID-19, the levels of lymphocytes and natural killer cells inhibitory receptor NKG2A are reduced and the levels of ACE2, interleukins 8 and 10, and interferon gamma-induced protein 10 are increased and hence, pregnancy is considered as a risk factor for COVID-19.

According to the World Health Organization, there is no apparent difference between pregnant and non-pregnant women respecting the clinical manifestations of COVID-19 (4,5). A study reported that physiological changes in immune response during pregnancy just predispose pregnant women to viral infections and hence, their response to COVID-19 may be similar to

their response to other viral infections which includes symptoms such as fever, cough, fatigue, and shortness of breath, or may even be asymptomatic (6). However, compared with non-pregnant women, pregnant women who develop severe COVID-19 have more need for intensive care services. Moreover, the presence of ACE2 receptors in the placenta may increase the risk of maternal transmission of COVID-19 to neonate (1). The Royal College of Obstetricians and Gynecologists also reported the possibility of vertical transmission of COVID-19 from mother to neonate (7). The role of syncytiotrophoblast cells in gas exchange and nutrient transport to fetus, multiplicity of ACE2 receptors in syncytiotrophoblast, and appearance of COVID-19 symptoms during the first thirty hours after birth are indicative of the probability of COVID-19 transmission from mother to neonate (8). This transmission can be confirmed through measuring the blood level of immunoglobulin M (5) because this immunoglobulin is not transported through the placenta and its appearance in fetal blood may be due to fetal response to infection. Moreover, most previous studies reported negative COVID-19 results in the samples obtained from the amniotic fluid, placental blood, genital system, breast milk, and neonatal throat among women with COVID-19, which rule out the possibility of vertical transmission (2).

However, a study reported positive COVID-19 results in placental or membrane samples obtained from women with moderate to severe COVID-19 at the time of childbirth, raising the possibility of intrapartum COVID-19 transmission. Therefore, cesarean section is supposed to shorten the length of fetal exposure to the birth canal tissues and thereby, reduce the risk of intrapartum transmission of COVID-19. Further studies are still needed before reaching definite conclusions in this area. COVID-19 transmission through breastfeeding is also unknown and decisions on breastfeeding among mothers with COVID-19 should be made based on the personal conditions of each mother; however, the neonates of these mothers are better to be separated from other neonates (2).

Pregnant women with COVID-19 are more likely to have a premature delivery and one fourth of their neonates are hospitalized in neonatal care wards (8). Healthcare providers should be provided with more information about the greater need for specialized care services among pregnant women with COVID-19 and their neonates, particularly those with underlying conditions (9). COVID-19 can lead to premature delivery, preterm premature rupture of membranes, and even maternal. The most prevalent complications among pregnant women with COVID-19 are intrauterine fetal distress (14%) and premature rupture of membranes (8%), while the most prevalent problems among their neonates are dyspnea (6%), gastrointestinal problems (4%), and fever (3%) (2). Placental assessments in the third trimester of pregnancy among women with COVID-19 showed maternal vascular thrombosis which implies abnormal maternal blood circulation, systemic inflammation, or placental hypercoagulation, and can lead to perinatal complications (3). Therefore, advanced care services such as close prenatal monitoring, early isolation of infected women, invasive infection control, oxygen therapy (to reach an arterial oxygen saturation of 95% or an arterial oxygen pressure of 70 mm Hg), fluid overload prevention, prophylactic antibiotic therapy, monitoring of uterine contractions, and mechanical ventilation in the presence of advanced respiratory failure should be considered for pregnant women with COVID-19 (8). Of course, noninvasive mechanical ventilation can slightly increase the risk of aspiration among pregnant women (9). Moreover, steroids can be used to promote fetal maturity, particularly among women with the risk of premature delivery; however, these medications should not be used routinely. Decisions on pregnancy termination and birth should be made based on gestational age, maternal-fetal stability and conditions, and consultation with infectious disease specialists (8). Further studies are needed to evaluate the relationship of pregnancy and COVID-19.

Conflict of Interests

The authors declare no conflict of interests.

Ethical Approval

Not applicable.

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