Pregnant women in the exposure to COVID-19 infection outbreak: the unseen risk factors and preventive healthcare patterns

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LETTER TO THE EDITOR

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These days, the most important health challenge in the world is the outbreak of novel coronavirus (COVID-19) infection. In December 2019, this viral disease originated as human-to-human transmission (HHT) in China's Wuhan city and then epidemically spread around the globe [1]. Based on the WHO data, HHT happens with close contact through sneezing and producing the respiratory droplets of infected individuals. There are two possible transmission routs for COVID-19: (i) settling these droplets in the mouth or nasal mucosa and lungs of people with inhaled air, and (ii) touching the disease-ridden surfaces or infected objects and subsequently touching hands to the mouth, nose, or eyes [2]. Due to the convenient ways to transmit viral infection, the aggressive prevalence of COVID-19 pneumonia, and its extensive social and economic impacts, there is an urgent need to explore health management tactics for slowing down the transmission of COVID-19 and decreasing the related-illness and death rate. It has been proven that this viral infection has a more pronounced effect on the elderly and patients with underlying diseases (e.g. hypertension, diabetes mellitus, cardiovascular diseases (CVDs), etc.) [3].

Pregnant women are one of the most critical population groups with a need to take additional precautions against the Covid-19 outbreak as a high risk of vertical transmission of COVID-19 in the late third trimester has been reported [4,5]. Besides, the presence of gestational diabetes mellitus (GDM) and preeclampsia in pregnancy may significantly weaken the immune system and increase the risk of COVID-19 infection. In the recent decade, there has been a profound demand for utilizing the *in vitro* fertilization (IVF) procedure among infertile couples. Studies have shown that the risk of developing GDM and preeclampsia in women treated with IVF is much greater than with women who conceived naturally [6,7]. Therefore, there is a higher risk of COVID-19 infection in women undergoing IVF. The prenatal anxiety, depression, and stress are also considered as prevalent public health issues in pregnant women. These psychological reactions can result in adverse birth outcomes such as miscarriage, preterm birth, low birth weight, and fetal death. Under the COVID-19 outbreak, stress- or anxiety-related concerns of mothers about their health and the health of their babies are growing exponentially. In nulliparous pregnant women, the adverse mood symptoms accompanied by childbirth fear may have irreversible effects on mother and child health. As a result, a set of health management practices in the event of COVID-19 outbreak must be adopted not only during late pregnancy but also during the first 3 months partum.

The first step in decreasing the COVID-19-related pregnancy complications is the creation of a proper self-care and hygiene protocol. A rapid weight gain near the end of pregnancy significantly reduces the mobility of pregnant women. Thus, the second rout of COVID-19 transmission is lower dominant in this population women, especially those who are in their third trimester of pregnancy. This potential care instruction may be in accordance with the following [1,8]: the number reduction of caregivers, the isolation of mothers in a spacious, air-conditioned room with good lighting, regular washing/sanitizing hands, wearing protective medical masks and gloves, avoiding touching the mouth, nose or eyes, and using 70% isopropyl alcohol to disinfect contact surfaces close to the pregnant person. The next step is the design, development, and implementation of an Internet-based guided self-help therapy (INSHT) for nutrition and healthy eating, physical activity, and psychological practices during pregnancy. As pregnant women's mobility is restricted, the online training programs *via* the Internet using electronic media can potentially promote the efficiency of health management guidelines. The INSHT-based encouragement of this population group to use of a healthy-functional dietary program rich of lactose, fiber, and mineral elements (e.g. magnesium and zinc) and vitamins (e.g. C, B-group and D) and low glucose and lipid amounts not only controls the prevalence of adverse maternal and neonatal outcomes [6], but also promotes pregnant women's immunity against the COVID-19 invasion [1]. Since pregnant women in a pseudo-quarantine system receive low amounts of vitamin D by reducing the sunlight exposure, it is necessary to take vitamin D supplements along with consuming nutritious diets. Also, the maintenance of an active lifestyle through continuous monitoring using the dynamic software installed on smartphones and tablets of pregnant women can keep them away from the stressful conditions of the COVID-19 outbreak. Moreover, moderate physical activity can be also associated with decreased diabetes and preeclampsia, improved immune system, and reduced risk of COVID-19 infection. Recent studies have reported that there is a relatively high rate of cesarean delivery and preterm labor in pregnant women infected with COVID-19 [9–11]. A standard balance in self-care strategies and the adherence to diverse training guidelines mentioned in INSHT not only can reduce/prevent the viral infection

in pregnant women, but also can change the childbirth mode from cesarean to vaginal.

Author's contribution

MM and LK were equally contributed in the preparation, writing, conceptualization, supervision, review and edit of the manuscript.

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