

Covid 19 and Pregnancy Vaccination: Challenges and Concerns

Pooyan Afzali Harsini¹, Gholamreza Imani², Saeed hamzehie³, Ali Khani Jeihooni^{4*}

¹BS. s of Public Health, Department of Public Health, School of Health, Kermanshah University of Medical Sciences, Kermanshah, Iran

²Department of Medicine, School of Medicine, Kermanshah University of Medical Sciences, Kermanshah, Iran

³Internal Medicine Specialist, Department of Medicine, School of Medicine, Kermanshah University of Medical Sciences, Kermanshah, Iran

⁴Departement of Public Health, School of Health, shiraz University of Medical Sciences, Fars, Iran.

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***Corresponding author:** Ali Khani Jeihooni, Department of Public Health, School of Health, shiraz University of Medical Sciences, Fars, Iran.

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Introduction

The 2019-nCoV (or COVID-19) outbreak began in Wuhan and has since spread throughout China and the world. A increase in new diseases and deaths poses severe public health and governance concerns in Wuhan. Governments have taken required activities such as limiting cross-city travel, case detection and contact tracing, quarantine, public education, and creation of detection kits with the help of the federal government. The society's unity has considerably decreased challenges including shortage of efficient medications, healthcare services, medical supplies, and logistics. The epidemic will be ended with the ongoing efforts of national and international multi-sectoral bodies. (1) 48.5 % of the world's population has had a COVID-19 vaccine. Globally, 6.84 billion doses have been given, with 25.52 million given daily. Only 3% of low-income persons have received one dosage.(2)

The FDA's recent approval of two COVID-19 vaccinations has sparked optimism for an end to the epidemic. Nonetheless, given the numerous obstacles to vaccine availability, distribution, and acceptance, as well as the introduction of variations that impair vaccine efficacy or override natural immunity, SARS-CoV-2 is likely to continue to circulate.(3)

Simultaneously, many COVID-19 vaccines have been created and approved at a breakneck pace, all while adhering to stringent regulatory requirements. (4)

Pregnant women's acceptance of the COVID-19 vaccination

Pregnant women had a greater risk of severe illness, ICU admission, and invasive ventilation compared to non-pregnant patients of the same age. As a result, pregnant women are designated a high-risk population for COVID-19 infection. Public health groups such as the American College of Obstetricians and Gynecologists and the Society for Maternal-Fetal Medicine recommend that COVID-19 immunizations be made available to pregnant women who prefer to be vaccinated.(5)

On the other hand, these vaccines will not be able to stop the epidemic unless they gain general acceptance. To prevent the COVID-19 pandemic, the community immunity level must reach at least 75%.

As a result, we must assess vaccine delivery alternatives and the level of vaccination acceptance necessary to restore society to pre-pandemic levels.(6) Even prior to the current COVID-19 pandemic, the World Health Organization (WHO) classified vaccine hesitancy as one of the top ten hazards to world health, defined as the delay in taking or refusing immunizations. Early acceptability assessments of the COVID-19 vaccine foreshadow global challenges in COVID-19 vaccine distribution. COVID-19 vaccine trials provided scant evidence on the vaccine's safety and efficacy in pregnant women and children. However, pregnant women with symptomatic COVID-19 may be at a greater risk of developing severe disease than non-pregnant women, whereas children appear to be at a lower risk of developing symptomatic COVID-19. Nonetheless, they have comparable infection rates, making them potential virus transmitters. To prepare for COVID-19 immunization initiatives, it is critical to assess vaccine confidence among mothers of young children and examine determinants of



vaccine acceptance or reluctance.(7) COVID-19 has infected almost 99,000 pregnant women in the United States alone, resulting in 109 maternal fatalities to date. Because both pregnant women and their newborns are at danger of acquiring the severe disease, the COVID-19 pandemic has highlighted the urgent need to create vaccine methods tailored to their needs.(3)

As CDC, there is presently no information on the Safety of COVID-19 vaccinations in pregnant women. Pregnant women who are members of a group that is advised to get vaccinated against COVID-19 (e.g., health care workers or vital workers) may choose to get vaccinated.(8) However, as WHO, When the benefits of vaccination to the pregnant woman outweigh the potential dangers, WHO recommends using the COVID-19 vaccine. Pregnant women should be informed about the dangers of COVID-19 during pregnancy, the possible advantages of vaccination in the local epidemiological environment, and the present limits of safety evidence in pregnant women to assist them in making this decision. Pregnancy testing is not recommended before vaccination, according to the World Health Organization. The World Health Organization does not suggest delaying or terminating a pregnancy due to immunization. (9) Also, The vaccine program was initiated without enough safety and efficacy evidence for pregnant women because pregnant and breastfeeding women are typically excluded from scientific trials. Despite this, several professional groups have acknowledged the importance of administering COVID-19 vaccines during pregnancy and have developed their own set of guidelines. However, a lack of evidence has frequently resulted in muddled messages, inconsistent terminology, and varying recommendations across organizations, which may contribute to pregnant women delaying or refusing immunization. (10)

Pregnant women's safety with the COVID-19 vaccination

In the United States, two mRNA vaccines (Pfizer-BioNTech BNT162b2 [Comirnaty], Moderna mRNA-1273) There is one vaccine available for inoculation that is based on a replication-incompetent adenovirus recombinant vector. (Janssen Ad26.COV2.S or JNJ-78436735). None of these vaccinations contain the virus that replicates; thus, they do not cause disease; however, they may result in immune system activation. Based on their mechanism of action and preliminary clinical evidence, experts believe that mRNA, viral vector, and protein/subunit vaccines pose no risk to women considering a pregnancy, pregnant women, the fetus, or breastfeeding infants.(11) Certain inactivated COVID-19 immunizations contain an adjuvant. Two adjuvants have been widely used in pregnancy vaccines (e.g., insoluble aluminum salts in Tdap, AS03-adjuvanted influenza vaccines) and have been shown to have a favorable safety profile.(12) Although vaccines containing novel adjuvants are normally avoided during pregnancy due to a lack of safety evidence, this theoretical concern should be balanced against the probability of a continued pandemic and the recognized risks of severe COVID-19 infection, including death, during pregnancy. Data from animal studies vaccinated pregnant women, and small prospective cohort studies have not revealed any harmful effects. Passive protection against SARS-CoV-2 in babies following maternal vaccination with mRNA vaccines has been shown to be conferred through a maternal immune response and the transfer of maternal antibodies across the placenta and into breast milk. (13-15) Protective antibodies have been documented in cord blood 15

days after the first maternal mRNA vaccination(16). Antibody titers were higher than those induced by SARS-CoV-2 infection during pregnancy in one cohort In the course of the inquiry, it was discovered that vaccine-generated antibodies were present in umbilical cord blood and nursing samples.(14)

vaccine-generated antibodies were found in umbilical cord blood and breast milk samples

Vaccination of neonates has been found to be less successful in preventing infection-related fatalities than vaccination of pediatric and adult populations. (17) Maternal immunization, a public health strategy focused on increasing maternal-to-fetal antibody transfer, has shown substantial promise in giving neonatal protective immunity before the infant's ability to establish a meaningful immune response to vaccination. Infections addressed by maternal vaccination schemes include respiratory diseases such as pertussis, which can be fatal to babies, and common pathogens that are dangerous to both pregnant women and newborns, such as the influenza virus.(18)

Important questions should be answered clearly before pregnant women receive the vaccination

With an increasing number of pregnant women receiving the vaccination throughout their pregnancy and breastfeeding, numerous important questions have arisen, including:

- • What is the safety profile of mRNA vaccinations in women who are pregnant or breastfeeding?
- Which immunizations elicit the most potent immunological response in the mother?
- Is there a difference in transplacental and breastfeeding antibody transfer efficiency depending on when the vaccination is given or the vaccine platform?
- What variables influence placental and breastmilk transfer efficiency?
- What evidence do you have that the transmission of humoral immunity from a mother to a kid gives long-lasting protection?

Conclusion

A passive approach to pregnant, puerperal, and breastfeeding women's requests for vaccination does not justify the absence of evidence on the efficacy and evaluation of immunological response to the SARS-CoV-2 vaccine. It is crucial to recognize that during the pregnancy-puerperal cycle, women are at a greater risk of severe COVID-19, and their children are at an increased risk of the detrimental effects of preterm delivery, providing a compelling argument for primary prevention. As a result, all women should be vaccinated during the pregnancy-puerperal cycle. Pregnant, puerperal, and breastfeeding healthcare providers, as well as those with risk comorbidities, will very certainly be prioritized for immunization. Notably, pregnant women must continue to get antenatal care and be aggressively educated on strategies to prevent SARS-CoV-2 transmission, such as strict hand cleanliness, social distancing, and mask wearing, regardless of vaccination status.

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