

# Women, Pregnancy, Breastfeeding and the Novel COVID-19 Vaccines

G. Willy Davila

“Science wins over coronavirus disease 2019 (COVID-19)”, the headlines are saying. With incredible speed, while not sacrificing scientific rigor, various companies have produced vaccines proven to be safe and effective for prevention of COVID-19 infection. The pandemic we have been living in since early 2020 will now have a fierce combatant to deal with; and if all goes as expected, herd immunity will become a reality and the pandemic will be controlled. This is an amazing feat from a population perspective, but should women have specific concerns as they consider receiving the vaccine, or not?

A few key facts deserve receiving emphasis: 1) The COVID-19 vaccines that are being initially approved (Pfizer-BioNTech and Moderna) are messenger ribonucleic acid (mRNA) vaccines. The mRNA is encapsulated in a lipid nanoparticle and delivered into the host cells. The host's cells then produce coronavirus spike protein which leads to production of antibodies against this foreign antigen. Unlike many other currently used vaccines, these vaccines are not live virus vaccines, do not enter the nucleus of host cells, and do not alter the human deoxyribonucleic acid (DNA) in the host. No genetic changes can occur in the host [1]. 2) Pregnant women, especially those from underserved populations, are susceptible to more severe forms of COVID-19 infection compared to non-pregnant women [2]. The Centers for Disease Control and Prevention (CDC) has listed pregnant women as a population at higher risk for severe consequences from COVID-19 infection, including intensive care unit (ICU) admission, need for mechanical ventilation and death. Although the risk is very low, these increased risks are disproportionately prevalent in minority, lower socioeconomic status populations [3]. 3) For lactating women, while breastfeeding, the inherent risks of severe COVID-19 infection is similar to the general population. Thus, the safety risks of vaccination do not outweigh the benefits achieved by a breastfeeding infant [1]. 4) Women contemplating getting pregnant, or at risk for pregnancy should be treated as anyone in the general population. Routine pregnancy testing, delaying pregnancy, or withholding the second dose in

a patient who already received the first dose of the vaccine are not necessary based on the theoretical safety concerns regarding these vaccines [1]. 5) Although administration of a COVID-19 vaccine can be associated with side effects such as fever, pain, and other influenza-like symptoms, a recipient cannot get COVID-19 infection from the vaccine.

The approved COVID-19 vaccines have not been specifically tested in pregnant women and as such there is no safety data related to pregnancy. However, there is no biologically-plausible theoretical basis for withholding the vaccines from pregnant individuals.

How about women who decide against receiving the vaccine when it becomes available to them? That decision should be respected, but a conversation should occur with her care provider to ascertain that her decision is being made in the face of as accurate information as is available to her. The risks associated with not getting vaccinated should also be openly discussed, including the risk exposure at work or elsewhere and then exposing household members such as parents, children and other susceptible individuals. Education may be needed to allay any specific fears that a woman may have. Regardless of whether a woman receives the vaccine, or not, preventive measures such as physical distancing, frequent hand washing and wearing a face mask should be followed until such a time as the public health authorities announce that preventive measures can be relaxed.

As vaccination reaches less developed parts of the world, where access to ICU beds, specific anti-viral therapies and other treatments available in developed countries is limited, the key role a vaccine plays in controlling the pandemic is even more critical. Access to vaccination will certainly be very challenging in many parts of the world where geographic and economic barriers can be paramount. Current vaccines which require transportation at sub-freezing temperature and administration in multiple doses, may not be practical in many parts of the world. Those areas may have to wait for further advances in vaccine technology which may be transported at room temperature and be effective with a single dose.

An enormous amount of data is being generated on a daily basis relative to COVID-19 infection and the role of vaccination in controlling its spread. As care providers for women, it is our role to help educate our patients about the role of vaccination in controlling this very serious viral pandemic. As specific populations such as pregnant women are studied, our knowledge base regarding the current COVID-19 vaccines (and forthcoming vaccines) will expand greatly, and facilitate us in helping patients make educated decisions about

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Department of Obstetrics and Gynecology, University of South Florida, Tampa, FL, USA. Email: GWilly.Davila@holycross.com

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vaccination. Nevertheless, in our current state of an expanding pandemic, growing mortality numbers, and continued need for social isolation, we should help our patients rejoice in the fact that we now have a powerful weapon to neutralize this very virulent organism, whether they are pregnant, breastfeeding, or not.

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### Financial Disclosure

None to declare.

### Conflict of Interest

None to declare.

### Data Availability

The author declares that data supporting the findings of this study are available within the article.

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