

COVID-19 vaccines

Estimated reading time: 2 minutes

Drug Levels and Effects

Summary of Use during Lactation

Several vaccines against SARS-CoV-2, the virus that causes COVID-19, are being developed; however, none have been studied during breastfeeding. The first two vaccines to become available in the US are messenger RNA (mRNA) vaccines. They are not live vaccines and are not expected to be appreciably excreted into breastmilk or absorbed by the infant. No non-live vaccines have ever been reported to cause infant adverse effects via breastfeeding.[1] Professional organizations have recommended that these COVID-19 vaccines be offered to those who are breastfeeding because the potential benefits of maternal vaccination during lactation outweigh any theoretical risks.[2-4] Given the current absence of direct evidence of vaccine safety during breastfeeding, clinicians are encouraged to undertake shared decision making with their patients, based on local community risk and the patient's risk factors.[5]

Drug Levels

Messenger RNA strands encode for the SARS-CoV-2 S "spike" protein, encapsulated within lipid nanoparticles. These nanoparticles are microscopic spherical-shaped mixtures of specialized fats, cholesterol, and polyethylene glycol that protect and deliver the mRNA strands to muscle cells after injection. Once inside the vaccine recipient's cells, mRNA is released, and its genetic code translated into viral S proteins. Those proteins are processed into peptides that are displayed on the cell surface, which then stimulates the antiviral immune response.[6] There is no plausible mechanism for intact viral S proteins to be distributed into the milk from the maternal circulation after immunization.

Free mRNA is rapidly destroyed by enzymes in the tissues and blood. Any intact vaccine lipid nanoparticles that are excreted into breastmilk and ingested orally by the infant during feeding would most likely be destroyed in the infant's gastrointestinal tract, which is a major reason why lipid nanoparticle-assisted RNA vaccines are limited to the parenteral route.[6,7] The tiny amount of polyethylene glycol-2000 in Pfizer-BioNTech vaccine is not absorbed orally excreted into milk, so breastmilk PEG exposure from maternal immunization is not a concern. Neither of the currently available vaccines contains a preservative or adjuvant.

Maternal Levels. Relevant published information was not found as of the revision date.

Infant Levels. Relevant published information was not found as of the revision date.

Effects in Breastfed Infants

Relevant published information was not found as of the revision date.

Effects on Lactation and Breastmilk

Relevant published information was not found as of the revision date. However, the humoral immune response to the mRNA COVID-19 vaccines is similar to those with COVID-19 disease,[8,9] and milk from mothers with COVID-19 contains SARS-CoV-2-specific immunoglobulins.[10,11]

References

1. Anderson PO. Maternal vaccination and breastfeeding. *Breastfeed Med.* 2019;14:215–7. [PubMed: 30888205]
2. American College of Obstetricians and Gynecologists. Practice Advisory. Vaccinating pregnant and lactating patients against COVID-19. December 13, 2020. <https://www.acog.org/clinical/clinical-guidance/practice-advisory/articles/2020/12/vaccinating-pregnant-and-lactating-patients-against-covid-19>.
3. Academy of Breastfeeding Medicine (ABM) statement: Considerations for COVID-19 vaccination in lactation. December 14, 2020. https://abm.memberclicks.net/abm-statement-considerations-for-covid-19-vaccination-in-lactation?fbclid=IwAR0LC26lCj_pJmpIHMa5QGdq9V8bN5XQsdIBYSyTXoYJMwqEP4SJIV2k5xw.
4. Society for Maternal Fetal Medicine. Experts in high-risk pregnancy respond to the FDA's decision to offer the newly approved COVID-19 vaccine to pregnant and lactating people. December 11, 2020. https://s3.amazonaws.com/cdn.smfm.org/media/2632/FDA_final.pdf.
5. Society for Maternal Fetal Medicine. SMFM: Provider considerations for engaging in COVID-19 vaccine counseling with pregnant and lactating patients. December 15, 2020. [https://s3.amazonaws.com/cdn.smfm.org/media/2641/Provider_Considerations_for_Engaging_in_COVID_Vaccination_Considerations_12-15-20_\(final\).pdf](https://s3.amazonaws.com/cdn.smfm.org/media/2641/Provider_Considerations_for_Engaging_in_COVID_Vaccination_Considerations_12-15-20_(final).pdf).
6. Le TK, Paris C, Khan KS, et al. Nucleic acid-based technologies targeting coronaviruses. *Trends Biochem Sci.* 2020 [PMC free article: PMC7691141] [PubMed: 33309323]

7. Verbeke R, Lentacker I, De Smedt SC, et al. Three decades of messenger RNA vaccine development. *Nano Today*. 2019;28:10766. [[CrossRef](#)]
8. Walsh EE, Frenck RW Jr, Falsey AR, et al. Safety and immunogenicity of two RNA-based COVID-19 vaccine candidates. *N Engl J Med*. 2020;383:2439–50. [[PMC free article: PMC7583697](#)] [[PubMed: 33053279](#)]
9. Jackson LA, Anderson EJ, Roupael NG, et al. An mRNA vaccine against SARS-CoV-2 - preliminary report. *N Engl J Med*. 2020;383:1920–31. [[PMC free article: PMC7377258](#)] [[PubMed: 32663912](#)]
10. Pace RM, Williams JE, Järvinen KM, et al. COVID-19 and human milk: SARS-CoV-2, antibodies, and neutralizing capacity. *medRxiv* 2020. PMID: 32995804.
11. Favara DM, Ceron-Gutierrez ML, Carnell GW, et al. Detection of breastmilk antibodies targeting SARS-CoV-2 nucleocapsid, spike and receptor-binding-domain antigens. *Emerg Microbes Infect*. 2020;9:2728–31. [[PMC free article: PMC7782901](#)] [[PubMed: 33258732](#)]

Substance Identification

Substance Name

COVID-19 vaccines

Drug Class

Breast Feeding

Lactation

Vaccines

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