

Breast milk may have potential protective effects against SARS-CoV-2, say researchers

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The COVID-19 pandemic was an especially harrowing time for pregnant people and new parents.

The uncertainties about how the new coronavirus could affect a pregnant person and their developing fetus—not to mention being cut off from support networks—left many expecting parents feeling isolated and anxious.

"It was a very surreal time," says Jenny Doyle, a Toronto mom who gave birth to her first child, Elliott, in 2020 and spent hours researching how the first vaccines made available the following year might affect her and her child. "At the time, vaccines for infants were still so far away. I remember hoping that some of the protection I'd received from my vaccine would pass through to Elliott."

Now, new findings from a study led by researchers at the University of Toronto and its partner hospitals suggest that is the case.

Published in the *American Journal of Clinical Nutrition*, the [study](#) looked for antibodies against SARS-CoV-2 in breast milk from three different cohorts: individuals who contracted COVID-19 while pregnant or nursing, routine milk bank donors and individuals who received two doses of the COVID-19 vaccine while pregnant or nursing.

The researchers detected antibodies in breast milk from roughly half of the people in the COVID-19 positive cohort. That's compared to less than 5 percent of routine milk bank donors, who did not have any known

exposures to COVID-19. In the vaccinated cohort, they found that antibodies levels were higher in people who had received the Moderna vaccine compared to those who had received the Pfizer-BioNTech vaccine. Unexpectedly, people who had shorter intervals between their first and second doses had higher antibody levels than those who waited longer between their immunizations.

"That finding definitely surprised me," says Samantha Ismail, the study's first author who completed her master's degree in the lab of Deborah O'Connor, the Earle W. McHenry Professor and chair of Temerty Medicine's department of nutritional sciences. "In [blood] serum, it's the other way around where longer intervals between doses typically result in higher antibody levels, suggesting that something different is happening in this lactating population."

In addition to Ismail and O'Connor, the study was led by Sharon Unger, medical director of the Roger Hixon Ontario Human Milk Bank at Sinai Health and a U of T professor of medicine and nutritional sciences, and Susan Poutanen, microbiologist and infectious disease consultant and Sinai Health and U of T associate professor of laboratory medicine and pathobiology.

The team took the study one step further by showing that some breast milk samples could prevent SARS-CoV-2 from infecting cells in a lab setting. Within the COVID-19 positive cohort, milk that contained antibodies against the virus were more likely to be neutralizing and immunization with the Moderna vaccine was associated with a stronger neutralizing capacity than the Pfizer-BioNTech vaccine.

The researchers also found a small but significant number of breast milk samples that prevented SARS-CoV-2 infection despite having undetectable levels of antibodies, suggesting that there could be other components in human milk that are active against SARS-CoV-2.

While these findings provide strong evidence to support the potential protective effects of human milk, Ismail cautions that the study alone is not enough to prove that breast milk provides tangible protection against COVID-19.

"COVID-19 vaccination and infection result in antibodies in human milk that have neutralizing capacity, but we don't know for sure how the neutralizing capacity seen in the lab translates to protection in infants," says Ismail, who is now a second-year medical student at U of T.

She points out that previous studies have shown a clear protective effect of antibodies in [human milk](#) against other viruses like enterovirus and rotavirus. To date, such studies have not been done with COVID-19.

Even so, the findings provide reassuring news to parents like Doyle, who breastfed her son longer than she had intended to ensure that he was still getting breast milk when she received her second COVID-19 vaccine.

"Trying to figure out how to protect this tiny being in that scary and bleak time, I was grasping at every little piece of information and whatever little piece of hope we had."

More information: Samantha Ismail et al, SARS-CoV-2 antibodies and their neutralizing capacity against live virus in human milk after COVID-19 infection and vaccination: prospective cohort studies, *The American Journal of Clinical Nutrition* (2023). [DOI: 10.1016/j.ajcnut.2023.10.008](https://doi.org/10.1016/j.ajcnut.2023.10.008)

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