

Sugars in some breast milk could help protect babies from group B strep

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Group B strep (GBS) bacteria remain the leading cause of severe infections in newborns worldwide. Now researchers have found that although the pathogen can be transmitted to infants through breastfeeding, some mothers produce protective sugars in their milk that could help prevent infection. They also report that the sugars can act as anti-biofilm agents, which is the first example of carbohydrates in human milk having this function.

The researchers are presenting their results today at the 254th National Meeting & Exposition of the American Chemical Society (ACS). ACS, the world's largest scientific society, is holding the meeting here through Thursday. It features nearly 9,400 presentations on a wide range of science topics.

"In most women, the group B strep that is present will not cause illness," Steven Townsend, Ph.D., says. "But for newborn babies, a GBS infection often leads to sepsis or pneumonia, and in severe cases death, because they don't have fully developed defense mechanisms," he says, adding that the elderly are also susceptible.

GBS infections in newborns less than a week old can be prevented. If a pregnant woman tests positive for group B strep during her last trimester, she can take antibiotics during labor to significantly reduce the risk that her baby will become sick at birth. This has been an effective prophylactic strategy for early-onset disease in the first week of life. But sometimes an infection can take hold later, between one week and three

months after infants are born.

Curious as to how GBS was infecting these young infants in the first place, researchers about 10 years ago found cases in which the [bacteria](#) were transmitted through [breast milk](#), despite [milk](#)'s known immunologic benefits. But because most babies do not become infected with group B strep, Townsend and others wanted to see if some women's breast milk contained protective compounds that specifically fight that bacteria.

"As carbohydrate chemists, we knew from previous research that milk carbohydrates are protective against other bacteria, so we figured there would be a chance they would be active against group B strep, too," says Townsend, who is at Vanderbilt University.

To test this hypothesis in a pilot study, his lab gathered five samples of breast milk from donors, isolated the complex sugars, also called oligosaccharides, and grew GBS in the presence of the sugars. The women's GBS status was unknown.

"When bacteria want to harm us, they produce this gooey protective substance called a biofilm, which allows them to thwart our defense mechanisms," Townsend says. "In the initial study, the sugars from one mother's milk killed nearly the entire colony. Another milk sample was moderately effective, while the remaining three showed diminished activity."

In the current study, his team members are testing more than a dozen additional milk samples to see if they can replicate their first round of results. So far, two samples have shown activity against both bacteria and biofilms; two just worked against bacteria but not biofilms; and four helped fight biofilm formation but not bacteria. Six were relatively inactive against both. Preliminary data also suggest that some mothers

produce milk sugars that make the bacteria more susceptible to common antibiotics, including penicillin and erythromycin. If these results bear out through future studies, these sugars could potentially become a part of an antibacterial treatment for infants or adults. They could also help reduce our dependence on some common antibiotics, Townsend says.

"The great thing about these sugars," he adds, "is that if they're safe for babies, they should be safe for everyone."

Provided by American Chemical Society

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