As exposure to chemical rises, so does risk of ending breastfeeding early

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Image: Wikipedia.

In recent years, the ubiquitous industrial chemical perfluorooctanoic acid (PFOA) has come under scrutiny for a variety of possible health problems including cancer and increased child adiposity. Now a study links maternal blood levels of the substance to early termination of breastfeeding.

"Women with the top-quartile serum PFOA concentrations during pregnancy had a 77 percent greater risk of ending any breastfeeding by three months and a 41 percent greater risk of ending any breastfeeding by six months compared to women with the lowest-quartile PFOA

concentrations," said lead author Megan Romano, a postdoctoral scholar in the Brown University School of Public Health. "These should be on our radar as chemicals that might be affecting women's ability to breastfeed."

The new analysis derives from the HOME study (Health Outcomes and Measures of the Environment), a group of 389 mothers and their children in Cincinnati that senior author Joseph Braun, Brown University assistant professor of epidemiology, has followed since pregnancy.

This study analyzed data from 336 HOME moms. Living downstream from a large plant that has emitted high volumes of chemicals, their average PFOA levels were more than twice that found in a national sample of pregnant women from across the U.S. Still, Romano said, even the top quartile of women in the HOME study had PFOA levels that are commonly seen elsewhere in the country. Virtually everyone has at least some blood level of PFOA, which has been used in making non-stick cookware, food container coatings and fire-fighting foam.

The study also measured an increased risk of early breastfeeding termination and exposure to a similar chemical, PFOS, but that link did not meet a threshold of statistical significance.

PFOA problems?

In this study in the journal *Environmental Research*, the team led by Romano and Braun focused on breastfeeding because animal studies have suggested that PFOA can disrupt it in several ways, including disrupting mammary gland development, altering lactation-related hormones, or disrupting expression of milk-protein genes, perhaps making the milk less palatable or limiting its supply.

Moreover, one study in Denmark had found a similar link between

PFOA exposure and early termination of breastfeeding. But that study did not account for prior breastfeeding by its mothers, which matters both because it can help predict future breastfeeding success and also because when women breastfeed they transfer PFOA out of their bodies.

When Romano and Braun's team accounted for prior breastfeeding in the HOME study, doing so reduced the strength of the association between PFOA exposure and early breastfeeding termination, but didn't eliminate it. The elevated risks they report in *Environmental Research* also accounted for other possible confounders including age of the mom at delivery, race, marital status, income, and smoking and alcohol history.

A potential barrier to breastfeeding

If the association between the exposures and early breastfeeding termination proves to be causal—this study was not designed to do that—then it will serve as an example of how environmental exposure presents another barrier to breastfeeding for some women, Romano said. Women who would prefer to breastfeed already sometimes struggle to overcome hurdles ranging from cultural or logistical ones to lacking medical support, she said.

Romano said she would like to continue to study possible biological mechanisms underlying the link, for instance by looking into whether the chemical disrupts hormones in people the way it appears to have in animal studies.

In the meantime, Romano said, women might be able to modify their risk by limiting their exposure to perfluoroalkyl substances, for instance by filtering drinking water in areas with a contaminated water supply, being mindful of grease- or water-resistant food packaging (e.g., avoiding microwave popcorn), and eating a balanced diet. Additionally,

individuals can avoid using personal care products and cosmetics that contain fluorinated ingredients.

Provided by Brown University