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# Researchers find that a commonly found contaminant may harm nursing infants

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Scientists at the Albert Einstein College of Medicine of Yeshiva University have shown that perchlorate—an industrial pollutant linked to thyroid ailments—is actively concentrated in breast milk. Their findings suggest that perchlorate contamination of drinking water may pose a greater health risk than previously realized. The study appears in the December 3-7 advance online issue of the *Proceedings of the National Academy of Sciences.*

For decades, millions of Americans have been exposed to perchlorate through contamination of their local water supplies. The U.S. Environmental Protection Agency has so far identified 75 perchlorate releases in 22 states, primarily California and states in the Southwest. Perchlorate is known to interfere with the ability of the thyroid, mammary glands and certain other tissues to absorb iodide from the bloodstream.

“Our study suggests that high levels of perchlorate may pose a particular risk to infants,” says Dr. Nancy Carrasco, senior author of the study and professor of molecular pharmacology at Einstein. “Nursing mothers exposed to high levels of perchlorate in drinking water may not only provide less iodide to their babies, but their milk may actually pass on perchlorate, which could further deprive the infants’ thyroid glands of iodide. The thyroid requires iodide to synthesize the hormones T3 and T4 that are essential for normal development of the central nervous system. Babies who don’t make enough of these thyroid hormones may become mentally impaired.”

Iodide is relatively scarce in the diet, and tissues that need to accumulate it—the breast and thyroid in particular—are equipped with a cell-surface protein called NIS (sodium/iodide symporter) that actively pulls iodide from the bloodstream and into the cells. NIS was first identified and cloned by Dr. Carrasco's team in 1996. In the current study, Dr. Carrasco and her colleagues injected female rats with perchlorate and then extracted the animals' breast milk and tested it on cells that express NIS. The milk inhibited iodide transport in NIS-expressing cells, indicating that perchlorate had become concentrated in the milk.

"We found that the same protein—NIS—that actively recruits iodide into cells does the same thing for perchlorate," says Dr. Carrasco. "In fact, NIS has a higher affinity for perchlorate than it does for iodide, which certainly heightens the risk posed by this contaminant."

Source: Albert Einstein College of Medicine