

Breastfeeding may reduce arsenic exposure in infants in arsenic-contaminated areas

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Arsenic contamination is a significant threat to human health in many parts of the world. Exposure to high levels of arsenic has been associated with a range of health problems such as diabetes, cognitive dysfunction,

and certain types of cancer. In addition, arsenic exposure during pregnancy can cause miscarriages, reduced fetal growth and greater risk of health problems for children born in regions with high levels of arsenic. However, little is known about exactly how arsenic passes between mothers and their babies—both born and unborn—in populations living in contaminated areas.

A [study](#) published in the *International Journal of Environmental Research and Public Health* used biomonitoring techniques to gain insight into different possible routes of arsenic exposure in pregnant women and their children. Findings from the study show that arsenic can be passed through the placenta during pregnancy, and breastfeeding may reduce arsenic exposure in infants compared to formula feeding.

In this study, Taehyun Roh, Ph.D., assistant professor at the Texas A&M University School of Public Health, joined colleagues from several [research institutions](#) in Mexico to compare arsenic levels of people living in arsenic-contaminated areas of Mexico and a comparison population with lower levels of exposure.

Inorganic arsenic species, which are most commonly found in drinking water and crops grown using [contaminated water](#), are known to cause oxidative stress and inflammation in humans, which can lead to a vast number of diseases over time. The health risks of arsenic exposure led the World Health Organization [to set a safe maximum level of 10 micrograms per liter](#). In Comarca Lagunera, a region in northern Mexico, average arsenic levels in drinking water are 82 micrograms per liter, far exceeding the recommended maximum.

Roh and colleagues collected samples of drinking water, maternal blood, urine and [breast milk](#) along with samples of placenta and umbilical cord blood right after birth. They also collected neonatal urine samples immediately and three to four days after delivery. The researchers

compared concentrations of arsenic in these samples against samples collected from populations living in areas with safe arsenic levels.

The researchers found significantly higher levels of arsenic in maternal blood and urine, umbilical cord blood, and breast milk in mothers living in Comarca Lagunera compared to uncontaminated regions. They also found that arsenic levels in cord blood were associated with levels in drinking water, and maternal urine samples from mothers and infants. These findings point to the placental passage as a major *in utero* transmission route for arsenic.

Infant urine samples collected days after birth showed continued high levels of arsenic, indicating a continuing source of [arsenic contamination](#) after birth. However, breast milk samples showed notably lower levels of arsenic than formula prepared with contaminated water.

This study found a clear association between maternal and neonatal arsenic exposure. The findings indicate transmission of arsenic through the placenta, which is consistent with existing research, and point to breastfeeding as a possible way to reduce arsenic exposure in infants compared to formula feeding. These findings highlight the importance of the further study of [arsenic exposure](#) and the need to develop interventions to reduce exposure in vulnerable groups.

More information: José Javier García Salcedo et al, Comparative Biomonitoring of Arsenic Exposure in Mothers and Their Neonates in Comarca Lagunera, Mexico, *International Journal of Environmental Research and Public Health* (2022). [DOI: 10.3390/ijerph192316232](https://doi.org/10.3390/ijerph192316232)

Provided by Texas A&M University

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