ECHO
Environmental influences on Child Health Outcomes
A program supported by the NIH

Study Summary

ECHO Study Finds No Association Between Arsenic Exposure and Birth Outcomes

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Who sponsored this study?

The Environmental influences on Child Health Outcomes (ECHO) Program, Office of The Director, National Institutes of Health supported this research.

Why was this study needed?

Arsenic is a naturally occurring, toxic chemical that can be present in groundwater and surface water. Drinking water, as a result, is one of the most common ways people are exposed to arsenic in the U.S. and globally. There have been a limited number of small studies of the association between arsenic and birth outcomes, mostly outside of the U.S. In this study, ECHO researchers examined a diverse group of pregnant people from across the country to determine if birth outcomes—birth weight, gestational age at birth, preterm birth, and size at birth—are influenced by arsenic concentrations that are above regulatory action levels.

What were the study results?

Researchers found that low birth weight, gestational age at birth, preterm birth, and birth size were not associated with potential exposure to arsenic among pregnant people living in a county with active arsenic level violations. There was a statistically significant increase in birth weight among infants whose mother's experienced continuous exposure (from three months before conception through birth) compared with infants from areas without violations.

Footnote: Results reported here are for a single study. Other or future studies may provide new information or different results. You should always consult with a qualified healthcare provider for diagnosis and for answers to your personal questions.

What was the study's impact?

Overall, drinking water violations for arsenic that could indicate the presence of the chemical above regulatory action levels are relatively uncommon. Researchers captured proxy exposure using residential history arsenic violations from the preconception period throughout pregnancy, a time when environmental influences could disrupt fetal growth.

Who was involved?

The study included over 15,000 mother-child pairs at 51 ECHO Cohort Study Sites across the United States. The children were born in 2006 or later, as the U.S. Environmental Protection Agency (EPA)

changed the enforceable standard for arsenic concentrations in drinking water to 10 parts per billion during that year. Only 794 participants experienced arsenic violations.

What happened during the study?

Researchers grouped pregnant people based on where they lived three months before conception and during pregnancy. Within those areas, investigators determined which public water systems had violations for arsenic. Then they looked at how living in a county with an arsenic violation might affect birth outcomes.

What happens next?

Future research could better identify ECHO participants' exposure to arsenic by considering other sources of drinking water (e.g., bottled or filtered water) and exposure to arsenic in foods.

Where can I learn more?

Access the full journal article, titled "Associations Between Area-Level Arsenic Exposure and Adverse Birth Outcomes: An ECHO-Wide Cohort Analysis," in *Environmental Research*.