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

Study Summary

Exposure to Multiple Chemicals During Pregnancy Associated with Adverse 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?

Pregnant women in the United States are regularly exposed to many chemicals through food, water, air, dust, and consumer and personal care products. While some chemicals are known to affect pregnancy outcomes, many widely used chemicals are not well-studied, including replacement chemicals used as alternatives to other potentially harmful chemicals. ECHO researchers wanted to better understand the degree of chemical exposure during pregnancy and whether these exposures are linked to differences in the length of pregnancy or birthweight for gestational age.

What were the study results?

On average, researchers detected 45 of the 113 chemicals studied in urine samples collected from pregnant participants. Exposures to certain types of chemicals during pregnancy were linked to differences in adverse birth outcomes. Certain phthalates (used in plastics) and polycyclic aromatic hydrocarbons (found in air pollution and some foods) were linked to shorter pregnancies or lower birthweight for gestational age.

Some understudied chemicals, including halogenated phenols which can be found in antibacterial products such as soaps and antiseptics, were also associated with lower birthweight for gestational age. Urinary concentrations of certain insecticides and benzophenones often found in sunscreen, laundry, and cleaning products were associated with longer gestational age at birth or higher birthweight.

What was the study's impact?

The study highlights the importance of understanding the health effects of newer or less well-understood chemicals that may be replacing older ones on pregnancy and child health. The findings underscore how widespread chemical exposures are during pregnancy and the importance of continuing to evaluate their potential health effects.

Who was involved?

The study included 5,318 mother–child pairs from 18 ECHO Cohort sites across the United States. Participants were enrolled between 2000 and 2021, and all pregnancies included were single births.

What happened during the study?

Researchers collected a urine sample during mid-pregnancy (around 25 weeks) and measured 113 chemical analytes from 10 classes of chemicals. They examined whether higher levels of these chemicals were associated with pregnancy length, birthweight adjusted for length of pregnancy, and risk of preterm birth.

The analysis accounted for several factors that can be associated with birth outcomes, such as maternal age, body mass index, education, tobacco use during pregnancy, and timing of sample collection.

Footnote: Results reported here are for a single study. Other or future studies may provide new information or different results. You should not make changes to your health without first consulting your healthcare professional.

What happens next?

Future research could explore whether these chemicals are associated with other child health outcomes, such as neurodevelopment, obesity, and asthma.

Where can I learn more?

Access the full journal article, titled “Gestational exposure to ten classes of priority chemicals and birth outcomes in the ECHO Cohort” in *JAMA Network Open*.

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