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Environmental influences on Child Health Outcomes
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Study Summary

Assessment of Chemical Exposures During Pregnancy Using Silicone Wristbands

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Who sponsored this study?

Research reported in this publication was supported by the Environmental influences on Child Health Outcomes (ECHO) program, Office of The Director, National Institutes of Health, and grant funding.*

Why was this study needed?

Pregnant women are exposed to chemicals that may be bad for their health or their babies' health. At the same time, the types of chemicals and their co-occurrence are not well understood. The researchers used silicone wristbands that capture chemicals in the environment to learn more about these exposures in a group of pregnant women in northern New England.

Who was involved?

This study included 255 women enrolled in the New Hampshire Birth Cohort Study (NHBCS) between 2017 and 2019. The NHBCS began in 2009 and includes more than 2,000 mother and child pairs.

What happened during the study?

During early pregnancy, the women wore the wristbands and went about their normal activities while chemicals in their environment became trapped in their wristbands. The women then returned the wristbands after one week and researchers measured the captured chemicals. This provided information about the chemicals in the women's environments.

What were the study results?

Researchers found 199 unique chemicals in the wristbands worn by women in the study. There were 16 chemicals, including chemicals in personal care products and consumer goods, which were found most often. Most women had comparatively low amounts of exposures to these chemicals but others had more unique combinations of chemical exposures. Education and behaviors, such as nail polish use, helped predict the level of chemical exposures.

Impact

This work helps identify opportunities and challenges for using tools like silicone wristbands to understand chemical exposures during pregnancy. The research team also identified common exposures and exposure patterns within the study population, which may be studied in future research.

What happens next?

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The team will connect the chemical exposure information collected from the silicone wristbands to maternal and infant health outcomes. This connection may show how chemicals influence human health and provide clues to prevent health problems. The team will also compare these wristband measurements to traditional measurements of chemical exposures. This will help scientists better understand the strengths and weaknesses of this new technology.

Where can I learn more?

Access the full journal article, titled "Assessment of Multipollutant Exposures During Pregnancy Using Silicone Wristbands."

Additional details

This work included collaboration with Dr. John Pearce, who, like Dr. Romano, is an OIF Cycle 1 Awardee. Dr. Pearce provided expertise related to the statistical methods used in this research, which he developed through his project entitled "Developing exposure characterization tools to address complex exposures within ECHO" (EC0155).

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