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

Study Summary

Young Children May Be Exposed to a Variety of Emerging Chemicals Found in Some Consumer Products

Authors: Jiwon Oh, Deborah H. Bennett, et al.

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?

Over time, exposure to chemicals like triclosan, parabens, phthalates, and PAHs became less common, likely because of new rules and bans on their use. However, replacement chemicals—like DINCH, a chemical that has replaced phthalates in some plastic products—and some pesticides have been showing up more often in later years. Exposure to multiple chemicals during pregnancy and early childhood is a concern because these are critical stages of development when children are more vulnerable to harm. Such exposures can increase their risk of health problems later in life. There is limited data tracking young children's – 2 to 4 years - exposure to environmental chemicals compared to older children. Prenatal and early-life exposure to these chemicals can increase the risk of multiple adverse child health outcomes. This study aimed to investigate early childhood exposures to a variety of environmental chemicals.

What were the study results?

Scientists measured 111 different chemicals in urine samples from young children and their mothers during pregnancy. More than half of the samples contained chemicals such as environmental phenols, pesticides, phthalates, and chemical markers of exposure to polycyclic aromatic hydrocarbons (PAH). About 34 chemicals were found in over 90% of the total samples. Compared to their mothers during pregnancy, children had higher amounts of certain chemicals, like bisphenol S (BPS)—a chemical used in some hard plastics and synthetic fibers as a replacement for BPA—and pesticide-related compounds. On the other hand, mothers had higher levels of chemicals like triclosan and monoethyl phthalate (MEP), markers of exposure to chemicals found in some consumer products like soaps and cosmetics.

Certain groups of children, such as younger kids, later-born siblings, and those from families with fewer resources, were exposed to higher levels of chemicals.

What was the study's impact?

This study suggests that young children may be exposed to a variety of emerging and replacement chemicals that may affect their health later in life. Continued monitoring in larger populations of young children can help researchers better understand how these exposures affect children's long-term health.

Who was involved?

The study included 201 children aged 2-4 years and their mothers recruited from six ECHO Cohort study sites across the United States.

What happened during the study?

Researchers collected urine samples from each child and their mother during pregnancy. These samples were analyzed for the levels of 111 different chemicals related to environmental exposures. The concentrations of these chemicals were compared between child and prenatal maternal samples. The researchers also examined social and environmental factors that may have influenced the concentration of each chemical in children's urine samples, such as race, ethnicity, maternal education, maternal age, and neighborhood opportunity.

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?

Additional studies tracking early childhood exposures to a variety of contemporary and emerging chemicals could help researchers better understand the potential effects these exposures may have on children's short and long-term health.

Where can I learn more?

Access the full journal article, titled "Exposures to Contemporary and Emerging Chemicals Among Children Aged 2-4 Years in the United States Environmental Influences on Child Health Outcomes (ECHO) Cohort," in *Environmental Science & Technology*.