Phthalate Replacement Chemical Associated with Lower Birth Weight

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KEY TAKEAWAYS:

- Higher pregnancy levels of some markers for di(isononyl) cyclohexane-1,2-dicarboxylate (DINCH) exposure were linked to slightly smaller babies at birth. DINCH is a chemical used to soften plastics and replace some phthalates.

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?

Phthalates are widely used chemicals found in many everyday items such as food packaging, flooring, building materials, medicine coatings, medical supplies, cosmetics, and personal care products. These chemicals have been linked to adverse pregnancy and child health outcomes. As manufacturers replace phthalates with alternatives presumed to be safer such as di(isononyl) cyclohexane-1,2-dicarboxylate (DINCH), ECHO researchers want to understand whether these newer chemicals may also affect maternal and child health.

What were the study results?

Researchers found that higher levels of chemical markers related to DINCH exposure in urine during pregnancy were associated with lower birth weight and a greater likelihood that infants would be born small for gestational age. Every tenfold increase in exposure to DINCH resulted in a 27-gram reduction in newborn birth weight. These associations differed by infant sex: associations with babies' physical length were stronger among boys while associations with being small-for-gestational-age were stronger among girls. Exposure during the third trimester appeared more strongly associated with reduced birth weight for gestational age than exposure earlier in pregnancy.

The researchers also found that measurable levels of these DINCH markers were common among pregnant participants, suggesting widespread exposure in this population.

What was the study's impact?

These findings suggest that prenatal exposure to this phthalate alternative may be associated with differences in fetal growth. However, the study was observational and cannot determine whether DINCH directly caused these outcomes. Additional research could help researchers understand how DINCH may affect pregnancy and fetal development and evaluate the safety of other phthalate replacements.

Who was involved?

Researchers analyzed data from 6,617 pregnancies at 22 ECHO Cohort study sites.

What happened during the study?

Researchers measured three DINCH breakdown products in urine from pregnant

women. They averaged measurements across pregnancy and within trimesters when available. They compared these levels with the babies weight and length at birth, the duration of pregnancy, and size for gestational age, accounting for maternal age, education, prior births, race and ethnicity, child sex, and study site.

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.

Where can I learn more?

Access the full journal article, titled “Prenatal exposure to di(isononyl) cyclohexane-1,2-dicarboxylate and adverse birth outcomes in the USA: a prospective analysis of births in a large American birth cohort,” in *Environment International*.

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