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

Study Summary

Following U.S. Dietary Guidelines During Pregnancy May Be Linked to Differences in Chemical Exposure

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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?

Certain chemicals can end up in food during farming, processing, packaging, storage, or cooking. During pregnancy, some of these chemicals can get into the body through food. In a recent study, ECHO researchers detected, on average, 45 of the 113 chemicals studied in urine samples collected from pregnant participants. However, the U.S. Dietary Guidelines for Americans do not take chemical exposures into account. These chemicals may interfere with how the body's systems work and could pose a risk for mothers and children. ECHO researchers wanted to know whether following these dietary guidelines closely during pregnancy was linked to lower exposure to chemicals. They also wanted to identify which parts of the diet were most closely related to chemical exposures.

What were the study results?

A diet during pregnancy that more closely followed U.S. Dietary Guidelines for Americans—such as eating more fruits, vegetables, whole grains, and lean proteins—was associated with differences in exposure to several types of chemicals when compared to those who didn't follow the guidelines as closely.

In this study, following the dietary guidelines was generally associated with lower levels of some chemicals commonly found in food packaging, cooking byproducts, and the environment. For example, levels of one chemical (phthalate) that can leach into food from plastic packaging were about 13% lower among participants who closely followed the dietary guidelines. Eating more lean protein was the biggest factor related to lower levels of most chemicals.

However, following the guidelines was not linked to lower exposure to all chemicals. Participants whose diets more closely followed the dietary guidelines also had higher levels of some pesticides, food preservatives, and chemicals used in personal care products. For example, levels of one pesticide were 9% higher among participants who closely followed the guidelines and eating more fruits and vegetables and less added sugar were the main food components contributing to higher levels.

What was the study's impact?

This study suggests that following the U.S. Dietary Guidelines for Americans during pregnancy may help reduce exposure to many chemicals but could increase exposure to others. The results highlight areas where consumers could benefit from additional guidance to help reduce their dietary chemical exposures. For example, while fresh fruits and vegetables are an important part of a balanced diet during pregnancy, they can also be a source of pesticide exposure. The researchers suggested choosing organic when possible and washing or peeling produce to help reduce pesticide exposure to continue eating these healthy foods. These findings could help researchers and health experts think about how future revisions to dietary guidance might support nutrition while also helping to lower chemical exposure during pregnancy.

Who was involved?

The study included 1,492 pregnant participants from six ECHO Cohort Study Sites in California, Illinois, Michigan, Tennessee, and Georgia.

What happened during the study?

Participants completed a food questionnaire or survey about what they ate around the middle of pregnancy. Researchers used this information to calculate how closely each person's diet matched the U.S. Dietary Guidelines for Americans, which is measured by the Healthy Eating Index. They also measured 113 chemicals in urine samples collected during pregnancy, covering 10 different classes of chemicals. Then they used statistical analyses to examine how diet quality was related to levels of chemicals in the body.

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 help identify practical ways to reduce chemical exposures through diet during pregnancy without lowering nutritional quality. The results may also help inform future updates to dietary recommendations and broader efforts to reduce chemicals in the food supply.

Where can I learn more?

Access the full journal article, titled "Dietary guidelines adherence and pregnancy exposure to 10 classes of priority chemicals: An observational study in the ECHO Cohort," published in the *American Journal of Clinical Nutrition*.

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