



ECHO

Environmental influences
on Child Health Outcomes

A program supported by the NIH

Study Summary

ECHO Study Finds Association Between Exposure to Certain PFAS and Maternal Depression & Stress During/After Pregnancy

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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?

[Per- and polyfluoroalkyl substances \(PFAS\)](#) are a large, complex group of synthetic chemicals found in some household products such as cookware and stain-resistant fabrics. These substances are often referred to as “forever chemicals” because they don’t break down easily, causing them to build up over time in water, soil, and air. Previous studies have shown that PFAS can negatively affect the brain, and there is conflicting evidence about their potential effects on depression and perceived stress during and after pregnancy. Depression and stress during these periods are common and linked to adverse health outcomes for both parents and children. This study aimed to clarify whether PFAS exposure during pregnancy is associated with an increased risk of depression and stress, and whether social factors affect these associations.

What were the study results?

Of the seven PFAS included in this study, some types were linked to changes in depression and stress for pregnant and postpartum participants. For example, higher levels of N-methyl perfluorooctane sulfonamido acetic acid (N-MeFOSAA) were associated with slightly higher depressive symptoms and perceived stress, especially postpartum, while higher perfluorodecanoic acid (PFDA) levels were associated with a lower risk of diagnosed depression and lower prenatal perceived stress. Exposure to perfluorooctanesulfonic acid (PFOS) showed a mixed pattern where moderate exposure was associated with increased depression risk, but the highest exposure was associated with lower depression risk.

When looking at all seven PFAS types as a group, there was generally no strong link to depression diagnosis or severity, but the data did show higher stress at low to moderate exposures, but lower stress as high exposure. The effects of PFAS were different depending on social factors. For example, people who were not born in the U.S. or who had higher social vulnerability sometimes showed stronger links between PFAS and depression or stress.

What was the study’s impact?

Overall, the associations observed in this study were small, so more research is needed to fully understand the effects of PFAS on pregnancy mental health. This study adds to mounting evidence that

PFAS exposure during pregnancy may have negative health effects during pregnancy, reinforcing the importance of minimizing exposure to PFAS during this sensitive time.

Who was involved?

The study included 4,403 pregnant participants from 16 ECHO Cohort study sites.

What happened during the study?

Researchers measured the levels of seven PFAS in the mother's blood during pregnancy. Pregnant participants reported whether they received a diagnosis of depression during pregnancy and filled out surveys on their depression and stress symptoms before and after giving birth. The researchers then used statistical methods to evaluate potential associations between PFAS exposure and mental health outcomes and how social factors may have influenced these associations.

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 studies could help researchers clarify the biological mechanisms linking PFAS exposure to depression and stress and explore the role of social factors in influencing these associations.

Where can I learn more?

Access the full journal article, titled "Gestational PFAS concentrations in association with maternal depression and perceived stress during pregnancy and postpartum in the ECHO cohort," in [Environmental Research](#).

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