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

Study Summary

Does Inflammation During Pregnancy Affect a Child's Ability to Regulate Their Emotions, Thoughts, and Behavior?

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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?

Inflammation is a normal part of the body's defense to injury or infection. The investigators in this study wanted to find out whether factors known to be linked with inflammation during pregnancy (such as socioeconomic conditions, environmental exposures, and maternal infections) might be associated with emotional, cognitive, and behavioral dysregulation in children after birth. "Dysregulation" in this context refers to children's attention, anxiety and depression, and aggression being measurably different from what is typically expected for children of their age.

What were the study results?

In this study, several maternal risk factors correlated with inflammation (lower education attainment, pre-pregnancy obesity, prenatal infections, and prenatal tobacco use) were strongly associated with dysregulation in offspring.

Researchers used a tool called the Child Behavior Checklist (CBCL) to measure aggressive behavior, anxiety/depression, and attention problems in children. Approximately 13.4 % of children and adolescents in the study met the criteria for the CBCL Dysregulation Profile. More youth with dysregulation (35%) were born to mothers with prenatal infections compared with 28% of youth without dysregulation.

Some additional maternal factors, including being overweight before pregnancy, lower education attainment, and smoking during pregnancy, were associated with higher likelihoods of childhood dysregulation. Children and adolescents who had a parent or sibling with a mental health disorder were more likely to experience dysregulation. Having a mother with gestational diabetes had no significant association with child dysregulation.

What was the study's impact?

By providing information about how maternal inflammation and relevant risk factors may be associated with dysregulation in a mother's offspring, this study can help inform interventions to improve child health outcomes.

Who was involved?

This study included 4,595 children and adolescents (ages 6-18 years) from 18 ECHO research sites across the United States.

What happened during the study?

This study assessed perinatal factors known to be related to maternal and neonatal inflammation.

ECHO researchers collected data on maternal factors before and during pregnancy, including information about infections during pregnancy. They used the CBCL to collect parent-reported information about each child's behavior. CBCL assessments were collected between 2009 and August 31, 2021, and researchers used these assessments to determine whether a child met criteria for the CBCL Dysregulation Profile based on their scores for aggression, anxiety/depression, and attention.

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 focus on identifying the mechanisms that link maternal factors with childhood dysregulation. These studies could also look at whether certain interventions are able to reverse or partially reverse the mechanisms that contribute to the development of dysregulation.

Where can I learn more?

Access the full journal article, titled "Perinatal Factors and Emotional, Cognitive, and Behavioral Dysregulation in Childhood and Adolescence," in the *Journal of the American Academy of Child and Adolescent Psychiatry*.