ECHO
Environmental influences on Child Health Outcomes
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Study Summary

Does smoking during pregnancy increase the child's risk for autism?

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Who sponsored this study?

This research was supported by the Environmental influences on Child Health Outcomes (ECHO) program, Office of The Director, National Institutes of Health.

Why was this study needed?

Previous studies provide varying results on how tobacco smoke exposure during pregnancy may affect risk for autism spectrum disorder (ASD) in children. Exposures to air pollution, which has many of the same chemicals as tobacco smoke but at lower levels, have also been linked with ASD. ASD is a complex condition that involves not only trouble in social interactions but also communication problems and patterns of repetitive behaviors or narrow interests.

The research team set out to conduct a study with participants from across the U.S. that could clear up inconsistencies found in previous research. Additionally, no other research has looked at the relationship between maternal tobacco smoking and milder autism-like symptoms of social impairment.

Who was involved?

Researchers studied approximately 11,000 children in 13 cohorts around the U.S. who either had a diagnosis of ASD, social impairment measurable on the Social Responsive Scale, or both. There also had to be information on exposure to prenatal smoking and other factors that could influence the study results.

What happened during the study?

Researchers pulled together and analyzed results from each cohort related to maternal smoking behaviors before or during pregnancy and childhood ASD diagnosis or ASD-related social impairment. The team took specific actions to prevent other factors related to the children and mothers from affecting the quality and consistency of the data.

What were the study results?

Smoking before or during pregnancy was consistently associated with ASD traits, such as symptoms of social impairments. Additionally, babies born at full term had a somewhat higher risk of receiving an ASD diagnosis as a child if their mothers smoked before or during the pregnancy.

More counseling is needed for pregnant women or those planning a pregnancy to help them understand how these potential risks for the child's behavioral development add to other poor outcomes associated

with smoking during pregnancy, such as low birthweight, increased likelihood of fetal or infant death, asthma in early childhood, or attention deficit hyperactivity disorder (ADHD).

Footnote: Results reported here represent results from 11 or seven studies, depending on the outcome. Other or future studies may provide new information or different results. Consult your healthcare professional for guidance on how to limit your unborn child's exposure to tobacco smoke. However, please also note that you have a greater chance of improving your child's health and their social and behavioral development the sooner you quit or reduce smoking.

Impact

There are many reasons for women to limit their exposure to tobacco smoke during pregnancy—tobacco smoke increases risk for low birthweight, ectopic pregnancy, a premature delivery, or fetal/infant death. Less research has been done to learn how tobacco smoke can influence children's health, although studies have linked prenatal smoking to higher childhood asthma and ADHD risk. This study shows how prenatal exposure to cigarette smoke may also harm a child's social development. Social skills can be important for success in school and getting along with others. Doctors, child educators, and other health and daycare providers should also know that children exposed to prenatal cigarette smoke may also be at higher risk for developing ASD.

What happens next?

Future studies can help researchers identify when babies are most at-risk to cigarette smoke exposure and how other factors associated with prenatal smoking may contribute to negative health outcomes.

Where can I learn more?

Access the full journal article, titled "Maternal Tobacco Smoking and Offspring Autism Spectrum Disorder or Traits in ECHO Cohorts" in *Autism Research*.

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