ECHO
Environmental influences on Child Health Outcomes
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Study Summary

What are factors that affect the incidence rate of asthma with recurrent exacerbations in children?

Authors: Rachel L. Miller; Christine C. Johnson, et al.

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.

What were the study results?

In this study, investigators wanted to gather more information about factors that influence the rates of childhood asthma with recurrent exacerbations (ARE)—a subtype of asthma where children experience frequent, severe episodes of asthma.

ARE incidence rates were highest among children ages 2-4 years old, and among non-Hispanic Black and Hispanic Black children. ARE rates were also higher among children living in the Northeast and Midwest compared to those living in the West. Children with a parental history of asthma had ARE rates 2.9 times greater compared to those with no parental history.

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 was the study's impact?

Higher incidence rates of ARE among young children, non-Hispanic Black and Hispanic Black children, and children living in the Northeast and Midwest suggest that differential environmental exposures may play a significant role in the onset of recurring asthma issues in children. ARE rates are consistently higher among children with a parental history of asthma, especially for young children, which may be due to a combination of genetic, environmental, and family lifestyle factors.

Why was this study needed?

While the prevalence of asthma has been reported widely in the United States and elsewhere, studies on childhood asthma incidence rates within specific populations and across various types of asthma and age ranges have been relatively sparse. Describing the incidence rates of ARE across various pediatric populations is a critical first step for identifying potential risk factors and causes.

Who was involved?

The research team leveraged data from 17,246 children born between 1990 and 2017 who were enrolled in 60 ECHO research sites in the U.S. and Puerto Rico. Child participants or their caregivers reported whether and when the child had an asthma diagnosis and any oral corticosteroids prescribed from a health care provider. Incidence rates of ARE were based on reports of systemic (not inhaled) corticosteroid use.

Of the 4,114 children diagnosed with asthma during this study, there were 2,061 children with at least one asthma episode when they used oral steroid medication; 734 of these children had 2 or more asthma episodes with steroid medication use and met the conditions for ARE.

What happened during the study?

The researchers calculated the incidence rates of ARE for the study population as a whole, along with the rates for subsets of the population defined by the year of ARE diagnosis, the decade they were born, their age and sex, their race and ethnicity, their residence at birth, and their parents' history of asthma. The researchers followed the children from birth until they developed ARE, reached the age of 20 years or the study period ended. The study identified children who developed ARE based on at least two reports of systemic steroid medication use at any time during the entire follow-up period. Children who received asthma diagnoses before age 5 years were required to have confirmation after 5 years, either by a parent or caregiver, adolescent self-report of asthma symptoms, hospitalization, emergency department or urgent care visit for asthma, provider visits due to asthma, or asthma medication use.

What happens next?

ECHO researchers are planning new studies that examine key early environmental exposures that could contribute to ARE, including viral respiratory tract infections, indoor allergens, environmental tobacco smoke, air pollution, stress, socioeconomic status, and where children live.

Where can I learn more?

Access the full journal article, titled "Incidence Rates of Childhood Asthma with Recurrent Exacerbations in the U.S. Environmental influences on Child Health Outcomes (ECHO) Program," in *The Journal of Allergy and Clinical Immunology*.

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