



## **Study Summary**

### ***No Significant Associations Observed Between Prenatal Antibiotic Use and Wheezing Symptoms in Infants***

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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?

Wheezing symptoms occur in 20-40% of infants, contributing to a substantial impact on children's quality of life and their use of healthcare. Multiple early exposures, such as prenatal exposure to cigarette smoking, have been associated with these wheezing symptoms.

Previous studies have suggested a possible link between antibiotic exposure during pregnancy and an increased risk of wheezing and cough in children, caused by an imbalance in the birthing parent's microbiome due to antibiotic use. However, these studies had some limitations. Additional research was needed to include enough participants to produce reliable results and account for other factors that might have influenced outcomes. This study examined the association between prenatal antibiotic exposure and the development of wheezing during infancy using a large national sample of infants and birthing parents.

#### What were the study results?

In this study, 36% of pregnant participants used at least one antibiotic while pregnant, and about 26% of infants had a report of wheezing. Overall, the research team observed that exposure to antibiotics during pregnancy was not associated with infant wheezing during the first 18 months after birth. Note that most outcome data were based on birthing parent/caregivers' self-reports.

Prenatal antibiotic exposure was also not associated with an increase in emergency room visits or hospitalizations for wheeze during infancy. However, prenatal antibiotic use was associated with higher odds of medication use for wheeze or dry cough during infancy, which could imply more severe symptoms and a medical provider's diagnosis. It is important to note that the study team found an association between prenatal antibiotic exposure and medication use for wheeze or cough during infancy only among children born via vaginal delivery and thus exposed to the birthing parent's microbiota. This finding supports the theory that a change in the microbiome of the birthing parent and infant is related to this association.

The researchers also observed an association between prenatal antibiotic exposure and wheeze in research sites that recruited participants who had a family history of asthma, suggesting that a genetic or environmental risk within these families may increase the likelihood of wheeze.

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?

The results of this study raise the possibility of an association between prenatal use of prenatal antibiotics and medication use for wheezing in the 18 months after birth. It suggested that prenatal antibiotics may influence respiratory outcomes during infancy, but further studies are needed to understand how the timing and type of antibiotic use may influence these effects.

### Who was involved?

This study included 4,721 pregnant participants and their 4,779 infants from 12 study sites in the ECHO Cohort Consortium. Most pregnant participants were between 25 and 35 years old, non-Hispanic White, and had a college degree or more. Overall, 36% of the pregnant participants used at least one antibiotic during their pregnancy.

### What happened during the study?

The study team analyzed data collected using questionnaires, interviews, or medical records to analyze associations between prenatal antibiotic exposure and airway symptoms (e.g., wheeze, cough) during infancy. The study team confined the outcome of wheezing to infancy (prior to the age when asthma is typically diagnosed), and they evaluated antibiotic exposure throughout pregnancy.

### What happens next?

Future research is needed to understand how the timing and type of antibiotic use during pregnancy influences infant wheeze outcomes. Additional studies are also needed to replicate these findings, which could then lead to clinical implications.

### Where can I learn more?

Access the full journal article, titled "Association Between Prenatal Antibiotic Exposure and Infant Wheeze Outcomes," in [Acta Paediatrica](#).

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