

Study finds early RSV infection linked to significantly increased risk of asthma in children

April 24 2023



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Severe respiratory syncytial virus (RSV) infection has long been associated with the onset of childhood wheezing diseases, but the relationship between RSV infection during infancy and the development of childhood asthma has remained unclear.

A new observational study by Vanderbilt University Medical Center researchers has found that RSV [infection](#) in the first year of life is associated with a significantly increased risk of asthma in children. The study, the first to look at the effects of RSV infections of all different severities on childhood asthma risk at a population level, was published in *The Lancet*.

RSV is a seasonal respiratory virus that affects almost all children by the age of 2 and repeatedly throughout life. It is the leading cause of bronchiolitis, a lower respiratory tract infection that presents as coughing and wheezing in infants and [young children](#). The symptoms are mild in most children and usually resolve in about a week, but it can lead to serious illness and death especially in premature or very young infants and those with [chronic lung disease](#) or congenital heart disease.

It is the most common cause of hospitalizations worldwide due to respiratory issues in the first year of life, said Christian Rosas-Salazar, MD, MPH, assistant professor of Pediatrics in the Division of Allergy, Immunology and Pulmonary Medicine, the first author of the study.

"For 60 years investigators have repeatedly identified the link between severe RSV and asthma; however, we've shown that this link is explained in part by shared heredity to both severe RSV and asthma," said the study's principal investigator and senior author Tina Hartert, MD, MPH, professor of Medicine and Pediatrics, director of the Center for Asthma and Environmental Sciences Research, Vice President for Translational

Research and the Lulu H. Owen Professor of Medicine.

"The solution in our study was to understand the link between RSV and asthma by ensuring all RSV infections would be captured using molecular techniques and post-season serology," she said.

"In our study, among healthy children born at term, not being infected with RSV in the first year of life was associated with a substantially reduced risk of developing childhood asthma, which affects about 8% of the children in the U.S.," Rosas-Salazar said. "Our findings show an age-dependent association between RSV infection during infancy and childhood asthma."

"We focused on the first year of life because we think the first year is a very important period of lung and immune development," Rosas-Salazar said. "We believe that when a child is infected with RSV in the first year of life, when the lungs and [immune system](#) are still under development, that could lead to certain abnormalities that can later cause asthma," he said.

The INSPIRE (Infant Susceptibility to Pulmonary Infections and Asthma Following RSV Exposure) study included 1,946 eligible healthy infants who were 6 months old or younger at the beginning of RSV season (November to March in Tennessee). The infants were recruited from 11 pediatric practices across Middle Tennessee. Biweekly surveillance and serology tests were used to classify infants as infected or not infected in the first year of life. Fifty-four percent of infants were infected with RSV in the first year of life; 46% were uninfected.

The infants were followed annually and then evaluated for asthma at 5 years old. The study found infants who weren't infected with RSV in the first year of life had a 26% lower risk of asthma at age 5.

"We hope the results of this study motivate long-term follow-up of common respiratory outcomes among children in ongoing clinical trials of RSV prevention products, including vaccines and monoclonal antibodies that can decrease the severity of the infection," Rosas-Salazar said.

"Showing efficacy of RSV vaccines against childhood [asthma](#) would increase public health interest and vaccine uptake," Hartert said.

More information: Christian Rosas-Salazar et al, Respiratory syncytial virus infection during infancy and asthma during childhood in the USA (INSPIRE): a population-based, prospective birth cohort study, *The Lancet* (2023). [DOI: 10.1016/S0140-6736\(23\)00811-5](https://doi.org/10.1016/S0140-6736(23)00811-5)

Provided by Vanderbilt University Medical Center

Citation: Study finds early RSV infection linked to significantly increased risk of asthma in children (2023, April 24) retrieved 14 May 2024 from <https://medicalxpress.com/news/2023-04-early-rsv-infection-linked-significantly.html>

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