Wheezing Rhinovirus Illnesses Predict Asthma

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SAN DIEGO — More than 75% of children who have a wheezing illness at age 3 years will develop asthma by age 6 years.

In addition, children who develop a wheezing illness caused by rhinovirus during the first year of life are three times more likely to develop asthma by age 6, compared with those who develop a wheezing illnesses caused by respiratory syncytial virus (RSV) or parainfluenza virus, according to new findings from the Childhood Origins of Asthma (COAST) study presented during a press briefing at the annual meeting of the American Academy of Allergy, Asthma, and Immunology.

"The big finding here is the association of the common cold virus with wheezing very early in life," said principal investigator Dr. Robert F. Lemanske Jr., professor of pediatrics and medicine at the University of Wisconsin, Madison.

Dr. Lemanske and his associates at the University of Wisconsin School of Medicine and Public Health launched the study, funded by the National Institutes of Health, in 1998. It is a birth cohort study of 287 children designed to assess genetic and environmental factors influencing the development of asthma. Study participants had to have at least one parent with confirmed aeroallergen sensitization and/or asthma. The researchers collected cord and annual blood samples to evaluate cytokine response profiles. They also collected nasal lavage samples at the time of scheduled study visits and during significant respiratory illness to ascertain viral illness.

Previous findings from the study have reported the relationship between wheezing viral illness during the first year of life and continued wheezing at age 3, but this marks the first report of findings at age 6.

"Although findings from other research groups have demonstrated a relationship between persistent wheezing patterns and children previously hospitalized with respiratory syncytial virus, there was no association between wheezing with RSV or parainfluenza virus during the first year of life and a diagnosis of asthma at 6 years of age in the study," said Kathleen A. Roberg, R.N., a study manager with department of medicine at the university. "But there was a threefold increase of an asthma diagnosis for those children who wheezed with rhinovirus during the first year of life."

She went on to note that as the children reached 3 years of age, more than 75% of children who had a wheezing illness—regardless of the viral etiology—went on to develop asthma by age 6. "Rhinovirus continues to be the most striking in this relationship. However, at age 3, RSV and parainfluenza viral wheezing illnesses are similarly related to the diagnosis of asthma." This suggests that "there is a time between ages 1 and 3 that is critical in the development of persistent wheezing in children."

In an interview, Dr. Lemanske said more research was needed to determine what drives the apparent association between wheezing rhinovirus illness early in the life and the subsequent development of asthma. "We're trying to determine if this is a host defect in terms of how these kids handle the common cold versus whether or not there are certain strains of the common cold virus that are more likely to get kids to wheeze. In the next phase of this project we'll look at that."

In another presentation, Rochelle A. Grabher reported that children in the COAST trial who had frequent respiratory illnesses during the first year of life had a higher incidence of asthma at age 6, compared with those who had no respiratory illnesses during the first year of life, yet other markers of atopy were unremarkable.

During the first year of life, 54 children had no respiratory illnesses, 204 had between one and four, and 29 had five or more, which was defined as frequent, said Ms. Grabher, a research coordinator with the university's department of medicine.

There were no statistically significant differences between the children with frequent respiratory illnesses and with no respiratory illnesses in terms of the incidence of a positive skin prick test at the 5-year study visit (52% vs. 45%, respectively), the incidence of a positive radioallergosorbent test at age 6 (58% vs. 36%, respectively), and the diagnosis of active atopic dermatitis at age 6 (38% vs. 23%, respectively).

However, 46% of children who had frequent respiratory illnesses during infancy had asthma at age 6 years, compared with 14% of children who had no respiratory illnesses during infancy, a statistically significant difference. ■

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