Asthma

PATHOPHYSIOLOGY

Transient Tachypnea of the Newborn May Be an Early Clinical Manifestation of Wheezing Symptoms

PURPOSE OF THE STUDY. To identify risk factors associated with transient tachypnea of the newborn (TTN) and its possible association with wheezing symptoms in early childhood.

STUDY POPULATION. Data were collected from the Population Health Research Data Repository at the Manitoba Centre for Health Policy. This was a retrospective evaluation of 12,763 children who were born at term. In this cohort, children with physician-determined bronchiolitis, acute bronchitis, chronic bronchitis, asthma, or need for prescription asthma medications were identified as having wheezing syndromes.

METHODS. Children diagnosed with TTN at birth were identified, and Cox proportional hazards regression analysis for time to first event of hospitalization, physician visit, or prescription for an asthma medication up to 7 years of age was performed. Hazard ratios were compared with those of healthy newborns.

RESULTS. A total of 308 (2.4%) of the study children developed TTN. Risk factors for development of TTN included maternal asthma, birth weight of ≥4500 g, male gender, and urban location. Infants with TTN at birth had a significantly increased risk of having a wheezing disorder in early childhood (adjusted hazard ratio: 1.17 [95% confidence interval: 1.02–1.34]).

CONCLUSIONS. TTN is associated with the development of wheezing syndromes in early childhood.

REVIEWER COMMENTS. TTN is generally believed to resolve in 2 to 5 days with no increased risk of pulmonary complications. The findings in this study suggest otherwise, with maternal asthma a risk factor for development of TTN. Nevertheless, the spectrum of wheezing disorders is broad, especially in this study where they evaluated onset of symptoms before 7 years of age, and not every young child with wheezing eventually develops childhood asthma. Additional studies to examine the association between TTN and wheezing before the age of 3 years may help determine if TTN plays a critical role in early pulmonary development.

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Early Detection of Airway Wall Remodeling and Eosinophilic Inflammation in Preschool Wheezers

PURPOSE OF THE STUDY. Eosinophilic airway inflammation and epithelial reticular basement membrane (RBM) thickening, absent in wheezy infants, may be present in preschool-aged children with severe, recurrent wheeze. This study compared RBM thickness and inflammation in endobronchial biopsies from wheezy preschool-aged children and age-matched control subjects.

STUDY POPULATION. Tissue for endobronchial biopsy was obtained from wheezy preschool-aged children (aged 3 months to 5 years) who were undergoing a clinically indicated fiber-optic bronchoscopy. Nonasthmatic controls were subjects undergoing fiber-optic bronchoscopy to investigate stridor.

METHODS. There were 16 children (median age: 29 months) with wheezing confirmed by video questionnaire (confirmed wheezers), 14 children (median age: 17 months) with reported wheeze (reported wheeze), and 10 (median age: 10 months) control subjects. Biopsy specimens were examined to compare eosinophilic inflammation (volume fraction of immunologically distinct inflammatory cells) and RBM thickness between the groups.

RESULTS. Median RBM thickness was 4.6 μm in children with confirmed wheezing compared with 3.5 μm in those with reported wheezing and 3.8 μm in controls. Median values for eosinophil density were 1.07% in confirmed wheezers, 0.72% in reported wheezers, and 0.0% in controls. Eosinophilic inflammation was significantly greater in confirmed wheezers compared with control subjects (P < .05). There were no between-group differences for any other inflammatory cell phenotype.

CONCLUSIONS. The characteristic pathologic features of asthma in adults and school-aged children develop in preschool-aged children with confirmed wheeze between the ages of 1 and 3 years, a time when intervention may modify the natural history of asthma.

REVIEWER COMMENTS. This study reconfirms that pathologic evidence of asthma can be found as early as 1 to 3 years of age. This also seems to relate to the time when lung-function abnormalities appear in preschool-aged persistent wheezers. Treatment during this critical period may affect the natural history of asthma.
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