Wheeze Phenotypes and Lung Function in Preschool Children

PURPOSE OF THE STUDY. To determine the relationship between wheeze phenotypes in childhood and lung function at age 3 and 5 years and determine if lung function at 3 years of age predicts the development or persistence of wheeze.

STUDY POPULATION. A population-based cohort of 874 children from the Manchester Asthma and Allergy Study. Subjects were recruited prenatally and followed up at 3 and 5 years of age.

METHODS. Subjects were assigned to categories on the basis of parental report of wheezing: “no wheezing” was defined as no wheezing by age 5; “transient early wheezing” was defined as wheezing before age 3 but none in the year before the 5-year follow-up; “late-onset wheezing” was defined as no wheezing before age 3 but wheezing in the 12 months before the 5-year follow-up; and “persistent wheezing” was defined as wheezing before age 3 and in the year before the 5-year follow-up. Specific airway resistance (sRAW) was measured at age 3 and 5 by body plethysmography when subjects were symptom-free. Postbronchodilator lung function was measured as sRAW after albuterol inhalation.

RESULTS. The 530 (60.6%) subjects successfully performing sRAW at age 3 were distributed as: 248 never wheezed, 115 had transient early wheeze, 22 had late-onset wheezing, and 78 had persistent wheezing. The 730 children successfully performing sRAW at 5 years old were distributed as: 384 never wheezed, 162 had transient early wheeze, 40 had late-onset wheeze, 104 had persistent wheeze, and 40 were not classifiable. At 3 years of age, the only significant differences in sRAW between groups was an increased resistance in those with persistent wheeze compared with children with late-onset wheeze (P = .04) and those who never wheezed (P < .001). At 5 years of age, sRAW was elevated in children with persistent wheeze compared with those with transient early wheeze (P = .02) and those who never wheezed (P < .001). Also, sRAW was significantly higher in those with transient-early wheezing compared with those who never wheezed (P = .01), but there was no significant difference between those who never wheezed and those with late-onset wheezing (P = .43). Among the subgroup of children who had wheezed by age 3, the risk of persistent wheeze increased markedly with increasing sRAW values.

CONCLUSIONS. Children with persistent wheeze have reduced lung function at 3 and 5 years compared with other wheeze phenotypes. In children who wheezed during the first 3 years of life, reduced lung function at age 3 predicted persistent wheezing. However, reduced lung function at age 3 did not predict late-onset wheeze in those who had not wheezed previously.

REVIEWER COMMENTS. It would be useful to be able to predict whether wheezing early in life will be transient or persistent. This study augments the findings of the similarly sized, longitudinal, Tucson Children’s Respiratory Study by suggesting that (1) poor lung function at age 3 is a predictor of persistent symptoms in those with a history of early wheezing, but for individuals the measurement has limited predictive value; (2) children with transient early wheeze have increased airflow resistance at age 5 compared with those who never wheezed; and (3) those with persistent wheeze and transient early wheeze both have airflow obstruction compared with the group who never wheezed. At age 5, the group with persistent wheeze also had lower postbronchodilator lung function than the group with no wheeze, indicating that factors other than smooth muscle contraction are present early in life. Additional studies are needed to determine the factors contributing to poor lung function early in life and to identify measures that would predict persistent wheezing in individuals.

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Asthma Phenotypes, Risk Factors, and Measures of Severity in a National Sample of US Children

PURPOSE OF THE STUDY. To determine if there are differences in risk factors and measures of severity between children with different asthma phenotypes.

STUDY POPULATION. The authors reviewed data from children aged 6 to 16 years derived from the Third National Health and Nutrition Examination Survey.

METHODS. The authors used questionnaire and skin-prick–testing data to separate children into the following categories: atopic asthma, nonatopic asthma, resolved asthma,
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