Relationship of Body Mass Index With Asthma Indicators in Head Start Children

PURPOSE OF THE STUDY. To examine the relationship of BMI and asthma in children in the Head Start program in Arkansas.

STUDY POPULATION. A group of 213 children aged 3 to 5 years with physician-diagnosed asthma were compared with 816 age-matched peer control subjects from the sample of the National Health and Nutrition Examination Survey (NHANES) and with 1024 children in prekindergarten in Arkansas public schools.

METHODS. Caregivers of the children with asthma from the Head Start program were interviewed with a structured questionnaire including the Juniper Asthma Quality of Life Survey, and the children’s medical charts were reviewed. One hundred forty-one of the 213 children underwent skin-prick testing. One hundred forty-five of the children had urine cotinine levels measured to determine exposure to environmental tobacco smoke. These data were compared with the 2 reference groups in a cross-sectional analysis.

RESULTS. The prevalence of obesity (BMI > 95th percentile) was significantly higher in the Head Start children with asthma compared with the NHANES children (P < .001) and the prekindergarten children (P < .05). Compared with Head Start children with a BMI at <85th percentile, Head Start asthmatic patients with a BMI at >85th percentile reported significantly more school days missed, lifetime hospitalizations, emergency department visits, activity limitations, and oral corticosteroid bursts. No significant differences were observed in rescue and controller medications, environmental tobacco smoke exposure, prick-puncture allergy testing, quality of life, or nighttime symptoms.

CONCLUSIONS. Obesity (BMI > 95th percentile) was associated with increased asthma prevalence and morbidity. There was no association with the number or type of asthma medications or atopic status.

REVIEWER COMMENTS. This is another study showing the association of obesity and asthma. In this study, 18.8% of the Head Start children with asthma had a BMI at >95th percentile, compared with 10.8% of the NHANES and 14.4% of the prekindergarten general-population children. The mechanisms of association have not been clearly established. Both conditions are characterized by chronic inflammation.

DIAGNOSIS AND MANAGEMENT
Pulse Oximetry Coupled With Spirometry in the Emergency Department Helps Differentiate an Asthma Exacerbation From Possible Vocal Cord Dysfunction

PURPOSE OF THE STUDY. These investigators sought to determine if they could find evidence for vocal cord dysfunction (VCD) in asthmatic adolescents whose condition failed to respond adequately to treatment in the emergency department (ED) for a presumptive asthma exacerbation.

STUDY POPULATION. Subjects with wheezing presenting to the ED of an urban children’s hospital were recruited. Inclusion criteria were age 12 to 21 years, failure to respond to treatment for wheeze sufficiently to allow discharge, and pulse oximetry reading of ≥97%. Exclusion criteria were having other cardiac or pulmonary disease, inability to perform spirometry, or need for endotracheal intubation.

METHODS. Spirometry with standard techniques was performed by using a computer-linked pneumotachygraph and appropriate software to capture both expiratory and inspiratory flow volume curves. Spirometric results were classified as small airway obstruction, variable extrathoracic airway obstruction (consistent with VCD), a combination of the 2 previous findings, or normal airflow.

RESULTS. Twenty ED encounters with 17 subjects were studied. Only 5 (25%) of the encounters included spirometric evidence of small airway obstruction, but 12 of 20 had evidence for VCD (ie, variable extrathoracic airway obstruction on the inspiratory loop). These 12 in-
included 3 that also had evidence for small airway obstruction. There were 6 encounters with no abnormality on spirometry.

CONCLUSIONS. Spirometry may identify presumptive refractory asthma exacerbations that, instead, are episodes of VCD.

REVIEWER COMMENTS. Several years ago we treated an 8-year-old boy who had been admitted to the hospital for status asthmaticus 4 times in 1 month but never had an oxygen requirement. A videotape of the boy when he was symptomatic (provided by the parents) showed obvious stridor, not wheezing. Similarly, in this study the cardinal observation was refractory “wheeze” without arterial desaturation. Computerized spirometry is not universally available in the ED, and in addition, not all such units have software capable of displaying the inspiratory limb of the flow-volume loop. However, in busy ED environments with large asthmatic populations, availability of this measurement should greatly aid the classification of wheezing events. Pediatricians need to be more aware that VCD may present symptoms that mimic asthma.

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Value of the Bronchodilator Response in Assessing Controller Naïve Asthmatic Children

PURPOSE OF THE STUDY. To define the bronchodilator response (BDR) cutoff point that best identified asthma to determine the frequency of abnormal spirometry results across severity.

STUDY POPULATION. Children with asthma (n = 346) and 51 children without asthma, aged 4 to 17 years, who met entry criteria for spirometry were identified.

METHODS. Controller-naive children were evaluated with clinical criteria alone to establish a diagnosis of asthma and severity classification and then compared with the BDR, which was calculated as the percentage change from the initial forced expiratory volume in 1 second (FEV₁). Receiver operator characteristic analysis determined the cutoff point for asthma diagnosis that gave the best combination of sensitivity and specificity.

RESULTS. The mean BDR in asthmatic subjects was 8.6% (95% confidence interval: 7.5%–9.8%), compared with 2.2% (95% confidence interval: 0.2%–4.3%) for the nonasthmatic subjects (P < .001). A BDR of ≥9% best differentiated these populations with a sensitivity rate of 42.5% and a specificity rate of 86.3%. Abnormal spirometry results, defined as a BDR of ≥9%, an FEV₁ of <80% predicted, or both, ranged from 44.4% for mild-intermittent bronchial asthma to 57.0% for severe-persistent bronchial asthma.

CONCLUSIONS. Spirometric criteria that include BDR can potentially identify children who have clinically mild asthma and might benefit from controller therapy.

REVIEWER COMMENTS. What a breath of fresh air (pardon the pun). Establishing a firm diagnosis of asthma in pediatric patients can be, at times, a real challenge. Clinical history, physical examination, and a low FEV₁ are all very useful in the diagnosis, but there are convincing data in children showing that an isolated, baseline FEV₁ is not a good measure of the presence of asthma or its severity. The findings from this investigation demonstrate that detecting bronchodilator responsiveness (ie, 9% cutoff value for improvement in FEV₁ after inhaled albuterol by metered-dose inhaler or nebulizer) can certainly aid in the diagnosis of asthma in children. A prospective assessment of this cutoff value in an unselected cohort of subjects, as well as the use of a single delivery system for the inhaled albuterol, will need to be investigated further to establish this measure as a useful diagnostic test for asthma in pediatric patients. Ultimately, use of the BDR in combination with baseline FEV₁ should help clinicians detect a population of children with asthma and which children would benefit the most from therapeutic interventions such as inhaled corticosteroids.

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Achieving and Maintaining Asthma Control in an Urban Pediatric Disease Management Program: The Breathmobile Program

PURPOSE OF THE STUDY. This observational study evaluated the asthma control achieved in children from a lower socioeconomic urban setting with regular participation in a disease-management guideline-based program.

STUDY POPULATION. Patients aged 3 to 18 years with asthma who were self-selected, predominantly Hispanic group recruited from lower socioeconomic areas of Los Angeles, California, served by the Pediatric Asthma Disease Management Program. Enrollment was from January 1, 1998, through June 30, 2006.

METHODS. The primary measure was physician-assessed asthma control based on National Heart, Lung, and Blood Institute guidelines from parent and/or patient recall. This included symptom frequency of <2 days per week and <2 nights per month for the 4-week period...
Pulse Oximetry Coupled With Spirometry in the Emergency Department Helps Differentiate an Asthma Exacerbation From Possible Vocal Cord Dysfunction

Larry W. Williams

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