The Role of the Social Environment in Children and Adolescents With Asthma
Chen E, Chmi LS, Strunk RC, Miller GE. Am J Respir Crit Care Med. 2007;176(7):644–649

PURPOSE OF THE STUDY. To test associations of neighborhood, peer, and family factors with asthma outcomes in youth and to determine the pathways through which these social factors operate.

STUDY POPULATION. Seventy-eight youths aged 9 to 18 years who were diagnosed with asthma by a physician were recruited.

METHODS. Youths completed questionnaires about neighborhood problems, peer support, and family support. Biological (immunoglobulin E level, eosinophil count, production of interleukin 4) and behavioral (youth smoking, exposure to smoke, adherence to medications) pathways were measured. Asthma symptoms and pulmonary function were assessed in the laboratory and at home for 2 weeks.

RESULTS. Lower levels of family support were associated with greater symptoms (β coefficients: −.26 to −.33; P < .05) and poorer pulmonary function (β: 0.30; P < .05) via biological pathways (ε statistics: 1.19–1.51; P < .05). Higher levels of neighborhood problems were associated with greater symptoms (β: .27–.33; P < .05). Peer support was not associated with symptoms or pulmonary function.

CONCLUSIONS. This study indicates that family factors may affect youths’ asthma via physiologic changes, whereas community factors may help shape the health behaviors of youths with asthma.

REVIEWER COMMENTS. Previous studies also have shown that dysfunctional family interactions predicted persistent atopic symptoms in children. This study is intriguing because it raised the possibility that family factors may affect youths’ asthma through direct biological mechanisms such as allergic inflammation rather than through medication adherence and other health behaviors such as smoking. Neighborhood factors were related to asthma outcomes through behavioral rather than biological pathways, possibly because neighborhoods set up norms for what type of behaviors are acceptable and because people tend to mirror the behaviors of those around them. This may better explain why community-wide asthma education and sponsoring health fairs have shown promising results. Limitations of this study include the sample size and the cross-sectional observational design.

Childhood Overweight Increases Hospital Admission Rates for Asthma

PURPOSE OF THE STUDY. To determine if childhood overweight increases the risk of hospitalization for asthma among children presenting to an emergency department with an asthma exacerbation.

STUDY POPULATION. Children who were >2 years old and presented to the emergency department of a Connecticut children’s hospital with an asthma exacerbation in 2005 were included in the study.

METHODS. A retrospective chart review was completed. Children were classified as overweight (>95th weight-for-age percentile) or nonoverweight (≤95th weight-for-age percentile). Children with chronic medical conditions other than asthma were excluded.

RESULTS. There were 884 visits for 813 children. Overall, 238 (27%) were admitted to the hospital, and 33 (4%) were admitted to the ICU. Overweight children (202 [23%]) were significantly more likely to be older (8.5 ± 4.4 vs 7.3 ± 4.3 years) and to inhabit an impoverished area (37% vs 28%). Overall, hospital admission was associated with higher clinical asthma score but not with age, gender, or poverty status. Despite similar asthma scores and therapeutic management in the emergency department, hospital and ICU admission was significantly more likely for overweight than nonoverweight children (odds ratio: 1.76 [95% confidence interval: 1.23–2.51]; P = .002).

CONCLUSIONS. Overweight children with an acute episode of asthma seen in an emergency department are significantly more likely to be admitted than their nonoverweight counterparts. Overweight status clearly impacts asthma management and health in children.
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 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.

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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-
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