was defined as chronic cough or wheezing responsive to bronchodilator. Atopy was defined as a positive skin prick test and symptoms consistent with allergic rhinitis. Patients were on inhaled corticosteroids for asthma and nasal steroids for allergic rhinitis. They had to be able to perform spirometry and not be on oral steroids.

METHODS. Observations were made in a 4-step sequence: (1) exhaled nitric oxide fraction (FeNO) measurement with a portable NIOX MINO (Aerocin Inc, Morrisville, NC; ≤35 ppb = controlled, >35 ppb = uncontrolled); (2) spirometry (forced expiratory volume in 1 second ≥80%, forced expiratory flow, midexpiratory phase ≥60%, peak expiratory flow rate ≥80% and forced expiratory volume in 1 second/forced vital capacity ≥80% = controlled); (3) childhood Asthma Control Test (cACT) (<19 = uncontrolled); and (4) clinical assessment by a pediatrician without knowledge of preceding results.

RESULTS. A total of 71 children (mean age 8.4 years; 46 boys and 25 girls) completed the study. The mean FeNO is uncontrolled asthma and was 37 ppb vs 15 ppb in controlled asthma (P < .005) but with considerable overlap. Comparison of individual spirometric indices revealed some correlation, but of the unrelated comparisons, those that agreed with each other most often (69%) were clinical assessment by the pediatrician and the cACT. Worst agreement was noted for FeNO and cACT (49.3%).

CONCLUSIONS. Overall this study revealed significant disagreement among many of the common methods used to assess asthma control.

REVIEWER COMMENTS. Asthma control is the key to successful management, and assessment of control is recommended in all major guidelines. It is nice to have different measures to choose from but disheartening to see the lack of agreement between tests. Previous studies have also shown a lack of agreement between many of these measures. The authors speculate that taking the individual patient’s asthma phenotype into consideration may be the key and that a combination of physician assessment and objective testing will be required. We continue to wait for the perfect test or combination of tests.

STUDY POPULATION. Five hundred thirty children in a prospective population-based birth cohort underwent a methacholine challenge and exercise challenge on separate days at age 10 years. At age 16 years, they underwent a clinical evaluation and repeat methacholine challenge.

METHODS. BHR was scored as follows based the methacholine dose causing a 20% drop in FEV1 (PD20): severe ≤1 µmol, mild to moderate 1 to 8, and borderline 8 to 16. Exercise-induced bronchospasm (EIB) is defined as ≥10% reduction in forced expiratory volume in 1 second 3 to 20 minutes after running. Active asthma is defined as at least 2 of the following: doctor’s diagnosis of asthma, asthma symptoms during the last 12 months, and use of asthma medication during the last 12 months.

RESULTS. Active asthma at age 16 was observed in 74% of the children with active asthma, and 10% of children without active asthma, at age 10. Fifty-four percent of the children with methacholine PD20 ≤1 µmol at age 10 had active asthma at age 16, 30% with PD20 1 to 8, 26% with PD20 8 to 16, and 31% with EIB. Separately the tests explained 10% (methacholine) and 7% (exercise) and together 14% of the variation in active asthma at age 16. In multivariate analysis, only methacholine PD20 ≤1 and active asthma at age 10 were risk factors for active asthma at age 16.

CONCLUSIONS. BHR at 10 years was a significant but modest predictor of active asthma 6 years later, with methacholine challenge being superior to exercise test.

REVIEWER COMMENTS. Not surprisingly, having methacholine-induced bronchospasm or EIB at age 10 increases the likelihood of active asthma at age 16, but most asthma at age 16 cannot be predicted by these tests done at age 10. When applied to children without active asthma at age 10, methacholine PD20 ≤1 had a positive predictive value of only 0.26 and EIB and a positive predictive value of only 0.12. Clearly the strongest predictor of active asthma at age 16 is active asthma at age 10.

Missed Sleep and Asthma Morbidity in Urban Children

PURPOSE OF THE STUDY. To address the question: How well does bronchial hyperresponsiveness (BHR) predict later clinical asthma?

PURPOSE OF THE STUDY. To investigate the effects of missed sleep on quality of life and asthma morbidity.

STUDY POPULATION. Parents of 147 asthmatic children ages 6 to 13 years from urban neighborhoods near Providence, Rhode Island, participated. Other inclusion criteria included...
a diagnosis of asthma from a physician, problems breathing in the last year, and current asthma medication use.

METHODS. Caregivers completed the Asthma Functional Severity Scale questionnaire to assess missed sleep. Limitation of activity and/or sports, along with school absence and emergency department visits over the previous year were also investigated as indicators of asthma morbidity on the Asthma Functional Severity Scale. The Pediatric Asthma Quality of Life (QoL) Questionnaire was also completed by the caregiver to assess the QoL of the caregivers. Another measure of emotions, the Behavioral Assessment System for Children, second edition, was also completed to assess anxiety. Further information regarding ethnicity was obtained.

RESULTS. Higher poverty levels had higher limitation of activity, more missed sleep, and lower QoL among caregivers. Overall, higher amount of missed sleep was significantly associated with school absence, more frequent emergency department use, sports and activity limitation, as well as lower QoL among caregivers. Latino children with more frequent reports of missed sleep did have significantly more limitation of activity and lower QoL among caregivers. Missed sleep and activity limitation were more strongly associated in children with high anxiety.

CONCLUSIONS. Missed sleep in children from urban neighborhoods, especially among Latino children, may be important in contributing to asthma morbidity in these patients. The authors suggest assessment of sleep may aid in the identification of children with increased asthma morbidity. The recommendation is for further studies to look at the effects of frequent sleep disruption due to asthma in children.

REVIEWER COMMENTS. This study brings several important topics that should be addressed during our visits with families with asthmatic children. The importance of sleep and the negative impact of missed sleep are highlighted. The study also reminds us that anxiety may be an exacerbating factor in our asthmatic patients. In the same way that behavioral assessments are part of the routine pediatric care of children, they may improve the overall care of our asthmatic patients.

Follow-Up Care After an Emergency Department Visit for Asthma and Subsequent Healthcare Utilization in a Universal-Access Healthcare System


PURPOSE OF THE STUDY. To describe the follow-up care for asthmatic patients within 28 days of an emergency department (ED) visit and its association with ED revisits and hospital admissions in the subsequent year.

STUDY POPULATION. In this study, 29,391 children with asthma between the ages of 2 and 17 treated in an ED in Ontario, Canada, between April 16, 2006, and February 28, 2009, had their chart reviewed in a population-based retrospective cohort study. Multiple linked health administrative data sets available through the Institute for Clinical Evaluative Sciences were used to gather data.

METHODS. Data were collected by using the National Ambulatory Care Reporting System, Canadian Institute for Health Information Discharge Abstract Database, and Ontario Health Insurance Plan claims database to identify ED visits, hospital admissions, and outpatient visits, respectively. Only children with preexisting asthma were chosen for the study. The primary and secondary outcomes were the number of children having an ED visit and those having a hospital admission for asthma within 29 to 365 days, respectively. Statistical analysis was done by using SAS (SAS Institute, Inc, Cary, NC) for UNIX.

RESULTS. Of the 29,391 children, 32.8% had a follow-up, 22.1% had an ED revisit, and 2.7% had a hospital admission. Having a follow-up visit was not found to be associated with ED revisit or hospitalizations (hazard ratio, 0.98; 95% confidence interval, 0.93–1.03 and hazard ratio, 1.06; 95% confidence interval, 0.92–1.23, respectively). Younger children, those who were in the lower income quintile, and those with more severe acute or chronic asthmatics at the time of ED visits were more likely to have ED revisits and hospitalizations. Other characteristics such as number of visits and type of physician providing care were not associated with outcomes.

CONCLUSIONS. Follow-up care was not accessed after an ED visit for asthmatic patients even in a universal health care setting. Those that did have follow-up had no association with reduced ED revisits and hospitalizations in the subsequent year.

REVIEWER COMMENTS. This study highlights the discrepancy between the factors we usually think are associated with good follow-up care for asthmatic patients presenting to the ED and what actually happens. Even with universal health care and accessibility, poor follow-up outcomes can still occur, thus it is important to work toward identifying other factors that have a greater impact on follow-up, ED revisits, and hospitalizations. Ultimately identifying these factors can help us to better manage and control our asthmatic patients.
### Missed Sleep and Asthma Morbidity in Urban Children

Vivian Hernandez-Trujillo

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