study. The final ICS dose for fluticasone was 370 μg/day (95% confidence interval [CI]: 263–477 μg) in the FeNO group and 641 μg/day (95% CI: 526–756 μg; \( P = .003 \)) in the guideline group. The rate of exacerbations per patient per year was 0.49 (95% CI: 0.31–1.49) in the FeNO group, compared with 0.9 (95% CI: 0.31–1.49; \( P = .27 \)) in the guideline group. There was no difference in the number, frequency, or time of first exacerbation between groups. There was no significant difference in nighttime awakenings, bronchodilator use, percent symptom-free days, or number of oral corticosteroid courses. There also was no difference in percent sputum eosinophils or pulmonary-function tests.

CONCLUSIONS. With the use of FeNO, control of asthma can be obtained with a lower ICS dose.

REVIEWER COMMENTS. The values for FeNO differ from other studies because a flow rate of 250 mL/second was used instead of 50 mL/second. The control group had downward titration of dose on the basis of symptoms, which was achieved only in a minority of patients. This may have magnified the observed difference in the ICS dose. This and subsequent studies suggest that markers of airway inflammation are becoming accepted as important surrogate markers of asthma control.

Patterns of Quick-Relief and Long-term Controller Medication Use in Pediatric Asthma

PURPOSE OF THE STUDY. To simultaneously examine adherence to long-term controller and quick-relief medications and to contrast patterns of medication use in children with asthma.

STUDY POPULATION. There were 75 children aged 8 to 16 years diagnosed with persistent asthma and prescribed quick-relief and long-term medications by metered-dose inhaler. Participants were a subsample of a larger adherence study.

METHODS. This was a cross-sectional, 1-month follow-up study. The primary outcome measure was adherence to both medications as measured by electronic monitoring devices. A classification framework for contrasting adherence patterns between medication classes was developed to identify cases for individual analysis.

RESULTS. High levels of nonadherence to long-term controller medications (median: 46% of prescribed doses taken) and variable patterns of quick-relief medication use (range: 0–251 doses over the month) were documented, but consistent relationships between patterns of medication use across both classes were not found. Individual cases identified by the classification scheme il-
Asthma as a Risk Factor for Invasive Pneumococcal Disease


PURPOSE OF THE STUDY. To determine if asthma is a risk factor for invasive pneumococcal disease.

STUDY POPULATION. Patients 2 to 49 years of age in a Tennessee Medicaid program (TennCare) with >1 year of continuous enrollment during the study period (1995–2002). For each patient with invasive pneumococcal disease, 10 age-matched controls were chosen. A total of 11 counties in Tennessee with a population of 2.8 million participated in the study. Asthma was defined as ≥1 inpatient diagnoses (admission or emergency visit), ≥2 outpatient diagnoses, or use of asthma-related medications. High-risk asthma was defined as an admission for asthma, an emergency department visit, long-term use of oral steroid, or use of ≥3 short-acting β agonists per year.

METHODS. Invasive pneumococcal disease was defined as isolation of strep pneumonia from a normally sterile site (eg, blood, cerebrospinal fluid, pleural fluid, surgical aspirate, joint fluid, and/or bone). The organisms were serotyped.

RESULTS. A total of 635 patients with invasive pneumococcal disease and 6350 controls were identified. A total of 18% (114 patients) with asthma had an invasive infection compared with 8.1% (516 patients) in the control group. Patients with asthma had increased risk of invasive disease (odds ratio: 2.4; 95% confidence interval: 1.9–3.1). In patients with high-risk asthma, the annual risk for invasive disease was 4.2 of 10 000 compared with 2.3 of 10 000 in the low-risk asthma group and 1.2 of 10 000 in the control group.

CONCLUSIONS. Asthma is an independent risk factor for invasive pneumococcal disease.

Reviewers Comments. The risk of invasive disease did not depend on comorbid conditions or advancing age. This is the first study to show the association and, if upheld with further data, will significantly affect our recommended immunization strategy for patients with asthma.

Exercise-Induced Dyspnea in Children and Adolescents: If Not Asthma Then What?


PURPOSE OF THE STUDY. Exercise-induced asthma (EIA) is the most commonly recognized cause of exercise-induced dyspnea (EID) in children and adolescents. However, EID in otherwise healthy children and adolescents may have other causes besides asthma. The purpose of this study is to report the outcome of evaluations for EID when other signs and symptoms of asthma were absent or there was no response to previous use of an inhaled β2 agonist.

STUDY POPULATION. One hundred forty-two patients, 6 to 21 years old (mean: 14 years), with EID were studied.

METHODS. In this retrospective study, investigators reviewed the results of all exercise tests performed in otherwise healthy patients with EID between 1996 and 2003. Physiologic measures assessed included preexer-
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