FEV₁ IS ASSOCIATED WITH RISK OF ASTHMA ATTACKS IN A PEDIATRIC POPULATION


Purpose of the Study. Objective measurements of pulmonary function are advised as part of the chronic assessment of children with asthma, because both patients and physicians are imperfect at assessing the degree of airway obstruction without such measurements. Furthermore, it is thought that these measures might predict important disease outcomes, such as exacerbations, disease progression, and functional impairment. These investigators examined the relationship between forced expiratory volume in 1 second (FEV₁) and subsequent asthma outcomes, specifically asthma attacks, during a longitudinal study of pediatric lung health.

Study Population. A retrospective cohort analysis of 13,842 subjects seen annually was analyzed for pulmonary function and answers to a respiratory questionnaire. The study entries consisted of all first and second graders from both the private and public schools in communities of 6 states in America.

Methods. Children were followed for up to 15 years. The annual questionnaire requested information as to any known diagnosis of asthma and any attacks of wheezing and shortness of breath within the past year. Questionnaires were answered by parents until children reached approximately age 14 years. The older children usually filled out their own questionnaires.

Results. Of the original study population, 3,626 children, comprising a total of 31,075 observations, reported an asthma attack at some time during follow-up. The analysis was restricted to the 95% of these children for whom questionnaire data could be paired with FEV₁ values 1 year earlier. Most had at least 7 observations. Predicted FEV₁ (FEV₁%) was categorized with 2 different schemes (<60%, 60%–80%, and >80%; also, <80%, 80%–100%, and >100%) for multivariate models. An asthma attack was reported at 27% of the observations. Both analyses showed that the risk of asthma attack increased as FEV₁% category decreased. Among the parent-reported group, the odds ratios for 2.1 and 1.4 and in the self-report group 5.3 and 1.4 for FEV₁% <60% and FEV₁% 60%–80% respectively, when compared to FEV₁ >80% for each reporting group.

Conclusions. The strong association between FEV₁% and risk of subsequent asthma attacks reinforces the importance of routine measurement of pulmonary function in the ongoing management of children with asthma. Because many downstream consequences of asthma are the direct result of airway obstruction, it makes sense to use a test that accurately and reproducibly measures baseline obstruction.

Reviewer’s Comments. No single parameter in history, physical examination, pulmonary function measurement, and therapy suffices to predict future adverse asthma outcomes, but FEV₁% belongs on a short list of important data to monitor. The authors point out that various clinical trials suggest that improvements in FEV₁ parallel improvements in other asthma outcomes such as exacerbations, health care utilization, symptoms, health-related quality of life, and rescue medication use. Any child on asthma controller therapy should have spirometry performed at least annually, but this is seldom done in primary care in the United States. One explanation for better asthma outcomes in the hands of allergists and pulmonologists likely relates to the routine incorporation of FEV₁ data in the overall clinical assessment.

A COMMUNITY-BASED STUDY OF NEAR-FATAL ASTHMA


Purpose of the Study. The objective of this study was to identify possible risk factors associated with fatal and near-fatal asthma in the Washington, DC, area during the time period in which the National Institutes of Health guidelines for the treatment of asthma have been available.

Study Populations. Participants were residents of the DC area who had a near-fatal or fatal asthma episode between January 1 and December 31, 1993. The 35 subjects in the study included both adults and children from local intensive care units (ICUs) who required endotracheal intubation for respiratory failure attributable to asthma. There were 33 near-fatal episodes and 2 deaths. Average age was 29.3 (±15.5) years; 14 (45.2%) were under 18 years old. The male to female ratio was 1.58. Eighty-four percent of subjects were African American, 12.9% were Caucasian, and 3.2% were Hispanic.

Methods. Participants or proxies were contacted within 2 weeks of their ICU admission. A letter was then sent to the study, followed-up by a telephone call for verbal consent and administration of a questionnaire. A supplemental questionnaire was administered to the family member or friend who had the most knowledge of the patient’s activities for the 24 hours before the hospital admission.

Results. The demographic information indicated a higher percentage of African Americans (84%) with near fatal asthma compared with the overall African American population in DC (64.8%). For subjects under 18 years old, the average length of diagnosis before the admission was only 2 (±0.05) years, versus 25.5 (±6.6) years for subjects over 18 years old. Forty percent of subjects had daily symptoms and 6.7% had no reported symptoms. Thirty-eight and 7 tenths percent stated they were sick with asthma “all the time” and 16.1% reported never having had an asthma attack prior to this admission. Forty-eight percent had never been hospitalized, 20.7% had been hospitalized 1 to 3 times, and 17.6% had >7 hospitalizations before this admission. Almost 67% had a previous history of intubation. Forty percent had a history of anaphylaxis or drug allergy. Ten percent of the subjects who were under 18 and 44% who were over the age of 18 had a history of smoking. Sixteen percent of the subjects reported not taking any asthma medications and 80% had a prescription for a short-acting β₂-agonist. Older subjects reported having more severe symptoms than patients <18 years old. Only 64.3% of the subjects contacted a health care provider during the 24 hours before admission. Mortality rates for DC were higher in females and in African Americans.

Conclusions. According to this study, age is a risk factor for fatal and near-fatal asthma. The lack of use of an antiinflammatory medications and the reliance on short-acting β₂-agonists were also clear risk factors. Other risk
factors, such as lack of access to health care and psychosocial issues, were also noted.

*Reviewers’ Comments.* This article presents several key risk factors for life-threatening asthma that may assist health care providers in recognizing those high-risk asthmatics. There were some weaknesses of the study that were also mentioned by the author, including the lack of a control group, the fact that data were based on self- or proxy reportings, and that the study was limited to 1 urban community. Overall, however, any data on the risk factors for fatal asthma are worth noting.

SALLY JOO, MD
ROBERT A. WOOD, MD
Baltimore, MD

THE BURDEN OF INFLUENZA ILLNESS IN CHILDREN WITH ASTHMA AND OTHER CHRONIC MEDICAL CONDITIONS

Neuzil KM, Wright PF, Mitchel EF, M.S., Griffin MR. *J Pediatr.* 2000;137:856–864

**Purpose of the Study.** To measure the burden of influenza among children with asthma and other medical conditions, many of whom do not receive influenza vaccination.

**Study Population.** Study participants included black and white children aged <15 years who were enrolled in the Tennessee Medicaid program from 1973–1993. Three high-risk patient categories were established including asthma, other lung disease, and other chronic disease. The second data set included ongoing prospective virus surveillance system at Vanderbilt University, which permits precise definition of the influenza season on an annual basis.

**Methods.** A retrospective cohort analysis was used to determine the rates of hospitalization for acute cardiopulmonary disease, outpatient visits, and antibiotic courses throughout the year. Annual differences between event rates when influenza virus was circulating and event rates during winter months when there was no influenza in the community were used to calculate influenza-attributable morbidity.

**Results.** Influenza accounted for an average of 19, 8, and 2 excess hospitalizations for cardiopulmonary disease yearly per 1000 high-risk children aged <1 year, 1 to <3 years, and 3 to <15 years, respectively. For every 1000 children, an estimated 120 to 200 outpatient visits and 65 to 140 antibiotic courses were attributed to influenza annually. Specifically in the group of asthmatic children <15 years, an estimated 10% to 20% had an additional outpatient visit during an average influenza season, and approximately 14% of these children received an additional antibiotic prescription.

**Conclusions.** Children <15 years with asthma and other chronic medical conditions experience substantial morbidity requiring inpatient and outpatient care during the influenza season. The hospitalization rates in this study are comparable to rates in adult high-risk populations for whom influenza vaccination is recommended. More effective targeting of this population for annual influenza immunization is warranted.

**Reviewer’s Comments.** Despite an increase in published medical evidence supporting the benefits of immunizing children with chronic lung diseases, particularly asthma, the rates of actual vaccination remain low. For example, in the United States, it is estimated that only up to 25% of children with moderate to severe asthma receive the influenza vaccine. In an average year, up to 30% of children will be infected with influenza, and this disease may cause substantial morbidity in children with and without chronic illnesses such as asthma. Current vaccine coverage rates for influenza among children with asthma remain unacceptable and creative strategies to utilize this preventive therapy, especially in patients with asthma, will continue to be a challenge that health care providers need to resolve.

JOHN M. JAMES, MD
Fort Collins, CO

DOES INFLUENZA VACCINATION PREVENT ASTHMA EXACERBATIONS IN CHILDREN?


**Objective.** Influenza is known to aggravate asthma; however, the effectiveness of the influenza vaccine in preventing influenza-related asthma is not known.

**Study Population.** Children 1 through 6 years old with asthma from 4 large health maintenance organizations.

**Methods.** This was a population-based, retrospective cohort study that used medical and vaccination records from 4 large health maintenance organizations within the United States during the 1993–1994, 1994–1995, and mid-1995–1996 influenza seasons. Children with asthma were identified by searching computerized databases of medical encounters and pharmacy records. The main outcome measures were exacerbations of asthma that were treated in the emergency room or hospital.

**Results.** Unadjusted rates of asthma episodes were higher after influenza vaccination than before vaccination. However, after adjusting for asthma severity, the incidence rate ratios of asthma exacerbations after vaccination were 0.78, 0.59, and 0.65 compared with the period before vaccination during the 3 respective influenza seasons.

**Conclusion.** After controlling for asthma severity, the authors found that influenza vaccination protects against acute asthma exacerbations in children.

**Reviewer’s Comments.** This is a useful study in that it supports the recommendation to provide influenza vaccinations to children with asthma, especially for those children with more severe asthma. Although other viruses clearly cause more asthma exacerbations than influenza, at least this one can be prevented. Additional prospective studies in larger populations to confirm these results would be very helpful.

CHRISTOPHER RANDOLPH, MD
Waterbury, CT

INSIGHT INTO PATIENT DISSATISFACTION WITH ASTHMA TREATMENT


**Purpose.** Measures of patient satisfaction or dissatisfaction with treatment are increasingly being used as indicators of quality of care. As these measures become more widely used, it is important to know if patient dissatisfaction is associated with important processes or outcomes of medical care.

**Patient Population and Methods.** Survey of patient-reported asthma management issues using the Asthma Therapy Assessment Questionnaire in a Kaiser health maintenance organization in the Pacific Northwest. Associations between patient dissatisfaction with asthma treatment and patient-reported measures of asthma control, patient-provider communication, and belief in asthma medications (self-efficacy) were examined.
A Community-Based Study of Near-Fatal Asthma
Sally Joo and Robert A. Wood
Pediatrics 2002;110;452

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A Community-Based Study of Near-Fatal Asthma
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