METHODS. Sleep-disordered breathing was measured by a written questionnaire to assess snoring, as well as by 2 nights of home pulse oximetry. The duration of the study was 1 year, and participants were prospectively followed every 6 months. Data collected at these visits included current asthma and allergy medications, Asthma Control Test score to determine asthma symptom burden, asthma-related missed school days, number of prednisone courses, number of unscheduled physician and emergency department visits, and number of hospitalizations since the previous visit.

RESULTS. Of the 108 children, 29 were diagnosed with severe asthma, and the remaining 79 had mild/moderate asthma. The severe asthmatics were more likely to be male, African American, and of lower socioeconomic status. Sleep-disordered breathing was strongly associated with asthma severity ($P < .01$). Obesity, as measured by BMI $z$ scores, did not have a significant association with asthma severity ($P = .31$). However, extreme obesity was more prevalent in severe asthmatics than nonsevere asthmatics (20.7% vs 10.1%, $P = .20$). Also, increases in BMI strengthened the association between sleep-disordered breathing and severe asthma.

CONCLUSIONS. Sleep-disordered breathing correlates with asthma severity. Obesity and asthma severity were not significantly associated.

REVIEWER COMMENTS. Previous studies have demonstrated parallels among obesity, sleep-disordered breathing, and asthma (Sulit LG, Storfer-Isser A, Rosen CL, et al. *Am J Respir Crit Care Med.* 2005;171[6]:659–664). However, the association of these disorders to asthma severity, particularly in the pediatric population, has not been thoroughly investigated. This study discovered an important association between severe asthma and sleep-disordered breathing. Future studies are required to examine these interactions in a broader population and to determine whether management of sleep-disordered breathing and/or obesity has the potential to ameliorate asthma prevalence and severity in children.

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Evidence for a Causal Relationship Between Allergic Sensitization and Rhinovirus Wheezing in Early Life


PURPOSE OF THE STUDY. To determine if there is a temporal relationship in the development of allergic sensitization and rhinovirus-induced wheezing.

STUDY POPULATION. There were 289 children studied who were part of a group of children at high risk for asthma and allergies who were enrolled at birth and followed prospectively in the Childhood Origins of Asthma (COAST) study.

METHODS. Children were followed for the first 6 years of life. Specific viral pathogens were identified in 90% of wheezing episodes during the first 3 years of life (nearly all outpatient illnesses). Peripheral blood was drawn annually to assess for aeroallergen sensitization.

RESULTS. Sensitized children were at significantly greater risk for viral wheeze than nonsensitized children (hazard ratio [HR] 1.9; 95% confidence interval [CI], 1.2–3.1). Looking at specific viral infections, allergic sensitization was associated with increased risk of wheezing from human rhinovirus (HR 2.3; 95% CI, 1.4–4.0) but not respiratory syncytial virus (HR 1.6; 95% CI, 0.87–2.9). Conversely, viral wheezing was not associated with increased risk of allergic sensitization (HR 0.76; 95% CI, 0.5–1.1).

CONCLUSIONS. Allergic sensitization increases the risk for all viral wheezing, especially for human rhinovirus wheezing but not respiratory syncytial virus wheezing.

REVIEWER COMMENTS. Allergic sensitization and viral wheezing early in life have both been associated with increased risk for child-onset asthma. This study is novel in that it is the first prospective cohort to identify allergic sensitization preceding viral wheezing. However, there are some previous data from another study finding severe respiratory syncytial virus bronchiolitis to be a risk factor for subsequent wheezing. If allergic sensitization is a primary event in the pathway to childhood asthma, it then would become a primary target for prevention.

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Preschool Asthma After Bronchiolitis in Infancy


PURPOSE. To evaluate the outcome of asthma in preschool-age children who were hospitalized at <6 months of age for bronchiolitis. Other predictors of childhood asthma were collected about parental risk factors and atopic dermatitis in children.

STUDY POPULATION. Full-term infants ($n = 166$) <6 months of age were enrolled upon hospitalization for bronchiolitis and were followed up at 5 to 6 years of age.

METHODS. From participant nasopharyngeal aspirates, 7 viruses including respiratory syncytial virus (RSV) and rhinovirus were assessed for the bronchiolitis etiology. At follow-up, questionnaires identified doctor-diagnosed
DIAGNOSIS AND MANAGEMENT

Does a Single Measurement of Exhaled Nitric Oxide Predict Asthma Exacerbations?  
Visser CA, Brand PL. *Arch Dis Child* 2011;96(8):781–782

PURPOSE OF THE STUDY. The ability to predict asthma exacerbations would be useful because it might be possible to intensify therapy and prevent the exacerbation. One proposed tool to predict asthma exacerbations is exhaled nitric oxide (FeNO). The study evaluated whether measurements of FeNO predict subsequent asthma exacerbations.

METHODS. The study included 103 children aged 6 to 16 years with asthma on daily inhaled corticosteroid controller therapy. At a scheduled follow-up visit, a single FeNO measurement was made (baseline). The children were then followed prospectively for 12 months for asthma exacerbations requiring systemic corticosteroids.

RESULTS. Ten patients (9.7%) had asthma exacerbations. The baseline FeNO was higher in children who went on to have exacerbations (median 41 ppb, interquartile range 33–71 ppb) than in those who did not (median 13, interquartile range 9–21 ppb, *P* < .001). However, there was complete overlap of FeNO values between groups.

CONCLUSIONS. The authors concluded that FeNO measurements are “useless in predicting asthma exacerbations.”

REVIEWER COMMENTS. Although the current study evaluated only a single FeNO measurement as a predictor of subsequent asthma exacerbations, many other studies have assessed using serial FeNO measurements to tailor asthma therapy. A meta-analysis published in 2012 (Petsky et al. *Thorax* 2012;67:199–208. doi: 10.1136/thx.2010.135574) concluded that “tailoring of asthma treatment based on FeNO levels has not been shown to be effective in improving asthma outcomes in children … there is insufficient justification to advocate the routine use of … FeNO in everyday clinical practice.” I believe FeNO has yet to prove itself to be a useful clinical tool.


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Development and Validation of the Composite Asthma Severity Index—An Outcome Measure for Use in Children and Adolescents


PURPOSE OF THE STUDY. To develop and validate a new instrument, the Composite Asthma Severity Index (CASI), which accounts for impairment, risk, and amount of medication to maintain control. Previous instruments do not take into account these measures in defining severity as outlined by the Expert Panel Report—3: For the Diagnosis and Management of Asthma.

STUDY POPULATION. Data from 546 children and adolescents in the Asthma Control Evaluation (ACE) trial were used initially to determine outcome domains of asthma. External validation of the severity index was achieved by using data from 419 children and adolescents in the Inner City Anti-IgE Therapy for Asthma (ICATA) trial, a double-blind, placebo-controlled multicenter trial of omalizumab versus placebo.

METHODS. Factor analysis was used to determine independent outcome domains of asthma using the data from the ACE trial. Next, 26 Inner City Asthma Consortium (ICAC) clinical investigators combined and weighted the domains into a final CASI score using a Delphi consensus process. The scale properties of CASI were then evaluated for construct validity (variability at different time points compared with variability of other asthma outcomes), internal consistency, and test-retest reliability. Finally, CASI was externally validated by using data from the ICATA trial.

RESULTS. Five independent asthma domains out of 11 outcomes were determined and in combination accounted...
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Alisha Bouzaher and Wanda Phipatanakul
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