included 3 that also had evidence for small airway obstruction. There were 6 encounters with no abnormality on spirometry.

CONCLUSIONS. Spirometry may identify presumptive refractory asthma exacerbations that, instead, are episodes of VCD.

REVIEWER COMMENTS. Several years ago we treated an 8-year-old boy who had been admitted to the hospital for status asthmaticus 4 times in 1 month but never had an oxygen requirement. A videotape of the boy when he was symptomatic (provided by the parents) showed obvious stridor, not wheezing. Similarly, in this study the cardinal observation was refractory “wheeze” without arterial desaturation. Computerized spirometry is not universally available in the ED, and in addition, not all such units have software capable of displaying the inspiratory limb of the flow-volume loop. However, in busy ED environments with large asthmatic populations, availability of this measurement should greatly aid the classification of wheezing events. Pediatricians need to be more aware that VCD may present symptoms that mimic asthma.

Value of the Bronchodilator Response in Assessing Controller Naïve Asthmatic Children


PURPOSE OF THE STUDY. To define the bronchodilator response (BDR) cutoff point that best identified asthma to determine the frequency of abnormal spirometry results across severity.

STUDY POPULATION. Children with asthma \( n = 346 \) and 51 children without asthma, aged 4 to 17 years, who met entry criteria for spirometry were identified.

METHODS. Controller-naive children were evaluated with clinical criteria alone to establish a diagnosis of asthma and severity classification and then compared with the BDR, which was calculated as the percentage change from the initial forced expiratory volume in 1 second (FEV₁). Receiver operator characteristic analysis determined the cutoff point for asthma diagnosis that gave the best combination of sensitivity and specificity.

RESULTS. The mean BDR in asthmatic subjects was 8.6% (95% confidence interval: 7.5%–9.8%), compared with 2.2% (95% confidence interval: 0.2%–4.3%) for the nonasthmatic subjects \( P < .001 \). A BDR of ≥9% best differentiated these populations with a sensitivity rate of 42.5% and a specificity rate of 86.3%. Abnormal spirometry results, defined as a BDR of ≥9%, an FEV₁ of <80% predicted, or both, ranged from 44.4% for mild-intermittent bronchial asthma to 57.0% for severe-persistent bronchial asthma.

CONCLUSIONS. Spirometric criteria that include BDR can potentially identify children who have clinically mild asthma and might benefit from controller therapy.

REVIEWER COMMENTS. What a breath of fresh air (pardon the pun). Establishing a firm diagnosis of asthma in pediatric patients can be, at times, a real challenge. Clinical history, physical examination, and a low FEV₁ are all very useful in the diagnosis, but there are convincing data in children showing that an isolated, baseline FEV₁ is not a good measure of the presence of asthma or its severity. The findings from this investigation demonstrate that detecting bronchodilator responsiveness (ie, 9% cutoff value for improvement in FEV₁ after inhaled albuterol by metered-dose inhaler or nebulizer) can certainly aid in the diagnosis of asthma in children. A prospective assessment of this cutoff value in an unselected cohort of subjects, as well as the use of a single delivery system for the inhaled albuterol, will need to be investigated further to establish this measure as a useful diagnostic test for asthma in pediatric patients. Ultimately, use of the BDR in combination with baseline FEV₁ should help clinicians detect a population of children with asthma and which children would benefit the most from therapeutic interventions such as inhaled corticosteroids.

Achieving and Maintaining Asthma Control in an Urban Pediatric Disease Management Program: The Breathmobile Program


PURPOSE OF THE STUDY. This observational study evaluated the asthma control achieved in children from a lower socioeconomic urban setting with regular participation in a disease-management guideline-based program.

STUDY POPULATION. Patients aged 3 to 18 years with asthma were a self-selected, predominately Hispanic group recruited from lower socioeconomic areas of Los Angeles, California, served by the Pediatric Asthma Disease Management Program. Enrollment was from January 1, 1998, through June 30, 2006.

METHODS. The primary measure was physician-assessed asthma control based on National Heart, Lung, and Blood Institute guidelines from parent and/or patient recall. This included symptom frequency of <2 days per week and <2 nights per month for the 4-week period.
before the visit, no severe flare-ups of asthma since the last visit, normal lung function, and no reported limitations on the patient’s activities or exercise. Other data collected included physician estimate of compliance with the management plan, indicators of asthma morbidity, and severity assessments based on guideline criteria. Cox regression analysis was conducted to determine the cumulative probability that a new patient will achieve asthma control with each subsequent visit.

RESULTS. A total of 2185 patients were eligible for evaluation of time to first achieve control, and 1591 patients were eligible to evaluate subsequent control maintenance. Of these patients, 70% to 87% achieved control by visit 3, and 89% to 98% achieved control by visit 6. Subsequent control maintenance was variable. Thirty-nine percent displayed well-controlled asthma (control at >90% of subsequent visits), and 13% had difficulty controlling asthma (control at <50% of subsequent visits). Maintenance of control was influenced by physician-estimated compliance with the treatment plan, baseline severity, and the interval between clinic visits.

CONCLUSIONS. Asthma control can be achieved in the majority of children in an urban setting if they participate in a structured disease-management program. Long-term maintenance of asthma control was variable, and physician-rated compliance was the factor most closely associated with the probability of controlled asthma in all severity groups.

REVIEWER COMMENTS. This study reported remarkably similar rates of initial asthma control across a broad severity spectrum in a lower socioeconomic urban setting. Equally noteworthy is the observation that maintaining such control was challenging across the severity spectrum, too. These findings reinforce the importance of routine monitoring of patients with persistent asthma, which is the cornerstone of recent revisions in the National Heart, Lung, and Blood Institute guidelines. This self-selected group of patients was more likely to be motivated and compliant with asthma-management plans. Nonetheless, this study shows what can be achieved, often with some difficulty, with a systematic approach in this patient population.

Purpose of the Study. To assess the inhalation technique of asthmatic children with varying inhalation devices over time.

STUDY POPULATION. The study included children between the ages of 6 and 7 years who were prescribed at least 2 β agonists or controller medications by a general practitioner during 2000–2003 in the Netherlands.

METHODS. Inhalation technique was evaluated twice by using a standardized checklist first at enrollment in the study (n = 530) and 1 year later (n = 362). If children used >1 device, they were asked to demonstrate (with a placebo) their inhalation technique for the different inhalers. The study was observational, and no inhalation instructions were given. At enrollment, parents were questioned on previous inhalation instructions.

RESULTS. A total of 131 (24%) children made ≥1 essential error with their inhaler devices initially. Children with a longer duration of asthma showed significantly more frequent incorrect inhaler performance. Incorrectly performing children with a metered-dose inhaler (MDI) with a spacer received less inhalation instruction by a health care worker as reported by the child or parent. The poor performance in children with a pressurized MDI was only slightly and not significantly better if they had received inhalation instruction (P = .2). Children who kept the same device more often demonstrated correct technique compared with the year before. This was irrespective of the type of inhaler and only significant for children with an MDI (without spacer). Despite this improvement after 1 year, children with an MDI again performed worse compared with all of the other inhaler types. Moreover, Discus and other dry-powder inhalation devices were more often demonstrated correctly compared with MDIs with or without a spacer. Of the children who were prescribed a new device, 21% (24 of 114) demonstrated an incorrect technique compared with 11% (26 of 241) of the children who kept the same device (P = .01). Furthermore, 41% (37 of 91) of incorrect performances appeared to be correct 1 year later. Conversely, 4% (11 of 300) of the correct performances were incorrect at the end of the study. The MDI was still significantly and strongly associated with incorrect technique.

CONCLUSIONS. Children are prone to use inhalation devices incorrectly if they are not monitored closely in correct use. Pressurized MDIs with and without a spacer were more prone to errors compared with dry-powder inhalers. Children prescribed a new device were more prone to usage errors.

REVIEWER COMMENTS. Although MDIs and dry-powder inhaler devices offer convenient and effective means of controller- and rescue-medication delivery, proper instruction and reinforcement of technique is essential to