improved outcomes for children with asthma and presents 1 model for doing so. The SB-TEAM concept eliminates many barriers to care and, particularly with changing reimbursement for telemedicine, presents a sustainable model for care. It is unclear from this study, however, how disruptive the SB-TEAM model may be to participants’ and their peers’ learning as well as whether a typical urban school would have the appropriate resources, particularly nursing staffing, to implement and maintain this model of care. Additionally, to better understand if improved care results from the SB-TEAM model itself versus just participating in the study, it would have been helpful to see a comparison between symptoms on school days and nonschool days such as weekends or school vacations.

Electronic Monitoring of Adherence to Inhaled Corticosteroids: An Essential Tool in Identifying Severe Asthma in Children


PURPOSE OF THE STUDY. To study if electronic monitoring could be used to separate patients with severe asthma with poor control. In addition, the purpose was to observe if electronic monitoring would lead to the optimization of standard asthma therapy.

STUDY POPULATION. This was a prospective observational cohort of children aged 5 to 17 years. The study included 108 children with asthma recruited from the outpatient department of Royal Brompton Hospital in London, United Kingdom.

METHODS. All children had an asthma diagnosis by standard protocols. Children were classified into 3 groups: severe therapy-resistant asthma, difficult asthma, and mild-to-moderate asthma. Baseline and end-of-monitoring period assessments included an asthma control test, lung function, fractional exhaled nitric oxide, asthma-related quality of life, and medication adherence using a smart inhaler.

RESULTS. Data for 93 children who completed the study were analyzed. The median days of monitoring was 92. Good adherence was found in 42% of patients who took ≥80% of medications. Suboptimal adherence was noted in 58% of patients (27% took 60%–79% of medications, and 31% took <60% of medications). No significant differences were seen between the adherence groups for the asthma control test, fractional exhaled nitric oxide, forced expiratory volume in 1 second, the exacerbation rate, or oral corticosteroid use. Four groups were identified after the data analysis: (1) good adherence with improved control (24%; likely previous poor adherence), (2) good adherence with poor control (18%; severe therapy-resistant asthma), (3) poor adherence with good control (26%; likely overtreated), and (4) poor adherence with poor control (32%).

CONCLUSIONS. This study revealed the importance of accurate adherence monitoring in children with asthma. Suboptimal adherence was noted in 58% of patients despite knowing that adherence was being monitored. The authors of this study identified patients with true severe asthma despite good adherence to therapy, suggesting that patients would merit further phenotyping of their asthma. In the study, researchers also confirmed the inadequacy of self-reported adherence and the limitation of prescription records.

Asthma Exacerbations and Triggers in Children in TENOR: Impact on Quality of Life


PURPOSE OF THE STUDY. To assess the impact of asthma triggers and exacerbations on asthma-specific quality of life in children.

STUDY POPULATION. A 3-year observational study, The Epidemiology and Natural History of Asthma Outcomes and Treatment Regimens, included a cohort of 438 children aged 6 to 12 years with severe or difficult-to-treat asthma recruited from 283 sites in the United States.

METHODS. Patients were seen at 6-month intervals, and data on health care use, asthma exacerbations, and number of recent asthma triggers were obtained. Patients and parents completed the Pediatric Asthma Quality of Life Questionnaire (PAQLQ) and the Asthma Therapy Assessment Questionnaire. Multivariable linear regression was used to model the PAQLQ score as a function of common asthma triggers.
RESULTS. Greater asthma exacerbation severity and number were associated with lower PAQLQ scores ($P < .001$), indicating poorer quality of life. PAQLQ was significantly lower in patients with more baseline triggers, and greater trigger number was associated with both severity and number of asthma exacerbations.

CONCLUSIONS. The number of baseline asthma triggers affects quality of life, exacerbation severity, and frequency of exacerbations in children aged 6 to 12 with severe or difficult-to-control asthma.

REVIEWER COMMENTS. Asthma is the most common childhood chronic disease in the United States, accounting for many missed school days and a significant social and economic burden for patients and families. The authors of this study emphasize the need to identify asthma triggers and to counsel patients on trigger avoidance as a way to reduce the number and severity of asthma exacerbations in children with severe and difficult-to-treat asthma. Addressing the psychosocial aspects of asthma via identification of baseline disease characteristics that negatively affect asthma-related quality of life can help lead to a patient-centered care approach.

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Fluid Balance Is Associated With Clinical Outcomes and Extravascular Lung Water in Children With Acute Asthma Exacerbation

PURPOSE OF THE STUDY. To investigate the effect of fluid overload on clinical outcomes in children hospitalized for an asthma exacerbation.

STUDY POPULATION. The retrospective cohort included children >6 years with only 1 admission to a single center for an asthma exacerbation during a 7-year period ($n = 1175$). Patients had to receive intravenous fluids within 24 hours of presentation and could not have chronic lung disease or acute pneumonia. From this same cohort, a quasitreatment group of children with multiple admissions, as defined by receiving $\geq 7\%$ peak fluid overload, was compared with a matched quasicontrol group who received $< 7\%$ ($n = 83$). A separate, prospective cohort included previously studied subjects who had a rhinovirus-triggered acute asthma exacerbation.

METHODS. Data on fluid intake and output were retrospectively collected from the electronic medical records for the first 72 hours of hospitalization or until discharge. The highest percentage of cumulative fluid overload within the first 72 hours was considered the peak fluid overload. Time to weaning $\beta$-agonist therapy to every 2 hours and duration of supplemental oxygen requirement were assessed. In the prospective cohort, ultrasound images of the lung and heart were obtained, and changes in the peak aortic velocity, as a surrogate for lower-airway obstruction, were measured.

RESULTS. In the retrospective part of the study, a $1\%$ increase in fluid overload was on average associated with an $\sim 7$-hour increase in hospital length of stay, an $\sim 6$-hour increase in the duration of $\beta$-agonist treatment, and an $\sim 2$-hour increase in the duration of oxygen supplementation. A peak fluid overload cutoff of $\geq 7\%$ was specifically identified as being associated with increased oxygen use and need for noninvasive positive pressure ventilation. Similar statistically significant associations were observed in the matched retrospective cohort and the prospective observational cohort. In the prospective cohort, a larger variation in peak aortic velocity correlated with more negative inspiratory intrapleural pressures. The combination of the peak fluid overload cutoff at $\geq 7\%$ and the high variation in peak aortic velocity was proposed as the physiologic mechanism for increased extravascular lung water and the aforementioned outcomes.

CONCLUSIONS. The combination of fluid overload and larger variation in peak aortic velocity, resulting in more lung water, provides a physiologic explanation for and is associated with worse clinical outcomes in children who are hospitalized with an acute asthma exacerbation.

REVIEWER COMMENTS. Understanding the factors that contribute to the clinical outcomes of hospitalizations for acute asthma is important toward making optimal management decisions. Fluid management is a common challenge in critical care but is often not considered a major player in acute asthma outcomes in pediatric patients. In this study, the authors raise the issue that perhaps more attention should be given to fluid administration and the fluid status in hospitalized children with severe asthma exacerbations.

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Positive Expiratory Pressure for the Treatment of Acute Asthma Exacerbations: A Randomized Controlled Trial

PURPOSE OF THE STUDY. To evaluate the effectiveness of positive expiratory pressure (PEP) in children presenting to the emergency department (ED) with moderate-to-severe asthma exacerbations.
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