METHODS. This retrospective matched cohort study examined database markers of asthma control from a large US longitudinal health care claims database, matched on baseline demographic characteristics and asthma severity. The 3 coprimary outcome measures were composites of key elements of asthma control derived from the database. “Risk domain asthma control” included absence of hospital/emergency department attendance, prescription for acute course of oral corticosteroid, and lower respiratory tract infection requiring antibiotics or hospital admission for lower respiratory reason. “Overall control (risk and impairment)” incorporated use of a short-acting β-agonist of no more than 2 puffs daily. “Severe exacerbation” was defined as hospital admission or emergency department attendance for asthma or an acute course of oral steroids. Secondary outcome measures included 3 additional composite end points. “Treatment success” was defined as risk-domain asthma control plus no change in asthma therapy, such as increase in ICS dose, change in ICS or delivery device, or use of additional controller therapy. “Sensitivity analysis of treatment success” sought to exclude changes in therapy that could have been motivated by cost savings. The number of “respiratory-related hospitalizations and referrals,” defined as unscheduled hospital admissions or emergency department attendance for lower respiratory tract reasons or planned hospital outpatient attendance for asthma, was determined.

RESULTS. After matching, there were 10 312 patients initiating ICS and 572 stepping up the ICS dose included in the analysis. Patients started on QVAR had significantly higher odds of achieving overall control. They also had a lower rate of respiratory-related hospitalizations or referrals than patients on Flovent. Other database outcome measures were similar in the 2 cohorts. Prescribed QVAR doses were lower (P < .001) than Flovent doses (320 vs 440 μg/d). Adjusted respiratory-related health costs were significantly lower for the QVAR group and represented annual savings of $390.

CONCLUSIONS. Asthma treatment outcomes were similar or better with QVAR prescribed at significantly lower doses and with lower costs than Flovent.

REVIEWER COMMENTS. The authors acknowledge that this study was not designed to evaluate the mechanisms behind the differences observed but speculate that the formulation characteristics for the HFA-beclomethasone pressurized metered dose inhaler are integral. We occasionally see fluticasone prescribed at inordinately high doses in children; these doses not only ignore the relatively flat dose–response curve for ICS but also likely have the systemic equivalence of several milligrams of prednisone per day. This study suggests that efficacy, cost, value, and, arguably, safety fall in favor of the beclomethasone product. Furthermore, given the smaller airway of the young child not included in this study population, the extra-fine particle size might magnify these benefits.

Effectiveness of Nebulized Beclomethasone in Preventing Viral Wheezing: An RCT


PURPOSE OF THE STUDY. The goal of this study was to evaluate the effectiveness of nebulized beclomethasone in preventing the recurrence of viral wheezing.

STUDY POPULATION. The study included preschool-aged children with a history of viral wheezing who were seen in 1 of 40 Italian pediatric clinics for an upper respiratory tract infection between October 2010 and March 2012. Children were between 1 and 5 years of age, had at least 1 episode of viral wheezing (physician diagnosed) in the preceding 12 months, and had no or minimal asthma-like symptoms between airway infections. Children were excluded if they had been on inhaled or oral corticosteroids in the month before the study or if they had other chronic lower airway disease (eg, cystic fibrosis, bronchopulmonary dysplasia).

METHODS. The study was designed as a randomized, double-blind, placebo-controlled trial. Children in the study population were randomly given either beclomethasone 400 μg or placebo twice daily for 10 days when seen in the clinic for an upper respiratory tract infection. Medications were delivered by nebulizer. Patients were clinically evaluated by a pediatrician at the start and end of the treatment period, and the parents performed a subjective evaluation of symptoms and treatment efficacy. The primary end point was the incidence of pediatrician-diagnosed viral wheezing during the 10-day treatment period.

RESULTS. Of a total of 525 children enrolled in the study, 521 were visited at the end of the treatment period. Wheezing was diagnosed by the pediatricians in 47 children (9.0% [95% confidence interval: 6.7 to 11.3]) with no statistically significant differences between treatment groups; for beclomethasone versus placebo, the relative risk was 0.61 (95% CI: 0.35 to 1.08). The treatment was considered helpful by 63% of parents (64% in the beclomethasone group vs 61% in the placebo group). Collectively, 46% of children had infection-related symptoms at 10 days, with no differences between groups.

CONCLUSIONS. Inhaled corticosteroids were not effective in preventing recurrence of viral wheezing, nor were there benefits found in reducing the symptoms of respiratory tract infections.
**Budesonide Nebulization Added to Systemic Prednisolone in the Treatment of Acute Asthma in Children: A Double-Blind, Randomized, Controlled Trial**


**PURPOSE OF THE STUDY.** The goal of the study was to test the hypothesis that adding high-dose nebulized budesonide to standard asthma treatment in children in the emergency department (ED) during the first hour would decrease their hospital admission rate.

**STUDY POPULATION.** The study population included children aged 2 to 12 years with physician-diagnosed asthma (or previous episodes of shortness of breath responsive to a β-agonist) who presented to the ED with a moderate or severe acute asthma exacerbation.

**METHODS.** Children were randomized within the pharmacy (double-blind) to receive 3 doses of 500 μg/dose of budesonide or placebo with a β-agonist (salbutamol + ipratropium bromide) via nebulization every 20 minutes over 1 hour. They also received prednisolone 2 mg/kg (maximum dose of 60 mg). Asthma severity was assessed by using a previously studied asthma scoring system. Patients were assessed at baseline and 1 and 2 hours after initiation of medication. Those who remained in the ED were also evaluated at 3 and 4 hours. A decision to admit or discharge was made at 2, 3, or 4 hours.

**RESULTS.** The study enrolled 723 children, with 139 re-enrolled at subsequent visits for a total of 906 randomization assignments. Overall, there was no statistical difference in admission rates, with 16.4% of the budesonide group versus 18.3% of the placebo group admitted (P = .38). On subgroup analysis, however, among the more severe group, significantly fewer children in the budesonide group were admitted versus the placebo group (P = .03). Among the subgroup with severe asthma, there was a 58% reduction in the risk of admission in the budesonide group versus the placebo group.

**CONCLUSIONS.** The addition of nebulized budesonide to standard ED treatment decreased admission rates in children with severe acute asthma.

**REVIEWER COMMENTS.** Although this study does not show a statistical difference between the beclomethasone and placebo groups, there are several important caveats. In screening for this study, 1371 children were seen and 846 children were excluded, mostly for wheezing at the baseline visit and corticosteroid use in the previous month. Had these children been seen a day earlier without wheezing, or a couple weeks later when they were “off” steroids, they may have qualified for the study; in addition, considering they may well have had increased bronchial hyperresponsiveness compared with some of the children in the study, this action may have accentuated the differences between beclomethasone and placebo. Although the conclusion of the study stands, it is important to note the strong trend in favor of beclomethasone, with a relative risk of 0.61 and the upper end of the 95% CI just eclipsing unity at 1.08 (associated with a P value of .09). A final point is that the study did not document when the child first exhibited signs of a viral upper respiratory tract infection. If the average child was not seen until day 3 (or even later), this delay in corticosteroid therapy could also bias the results to show minimal differences. In this regard, a useful follow-up study would be to repeat the protocol but only allow entrance in the first 24 to 48 hours of an upper respiratory tract infection; this early intervention would mimic what we currently tell our parents to do.

**URL:** www.pediatrics.org/cgi/doi/10.1542/peds.2014–181700X

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Pediatrics 2014;134;S177
DOI: 10.1542/peds.2014-1817XXX

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