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.

Dexamethasone for Acute Asthma Exacerbations in Children: A Meta-Analysis


PURPOSE OF THE STUDY. The goal of this meta-analysis was to determine whether intramuscular or oral dexamethasone is equivalent or superior to a 5-day course of prednisone or prednisolone for acute exacerbations of asthma.

STUDY POPULATION. Children ≤18 years of age presenting to the emergency department (ED) with acute exacerbations of asthma requiring systemic steroids were included in the study.

METHODS. The authors performed a meta-analysis of 6 randomized controlled trials of acute asthma exacerbations in...
children presenting to the ED. Treatment with dexamethasone was compared with prednisone/prednisolone treatment for the primary outcome of return visits or readmissions to the hospital.

RESULTS. The authors report similar relative risks (RRs) of relapse at all time points between the 2 groups: 5 days (RR: 0.90 [95% confidence interval (CI): 0.46–1.78]), 10 to 14 days (RR: 1.14 [95% CI: 0.77–1.67]), and 30 days (RR: 1.20 [95% CI: 0.03–56.93]). Dexamethasone was associated with a lower incidence of emesis in either the ED (RR: 0.29 [95% CI: 0.12–0.69]) or home (RR: 0.32 [95% CI: 0.14–0.74]).

CONCLUSIONS. The authors recommend that clinicians consider single or 2-dose regimens of dexamethasone as a robust alternative to 5 days of prednisone/prednisolone.

REVIEWER COMMENTS. The authors demonstrate by meta-analysis that dexamethasone and prednisone/prednisolone are equally effective therapy regarding prevention of revisits to the clinic, ED, or for hospitalization, but adherence is likely better with the shorter course and is better tolerated. The studies are not sufficient in statistical power to determine whether intramuscular or oral dexamethasone are equivalent. Finally, the generalizability of these conclusions to other health care settings outside of the ED is a subject for future studies.

Question 1: Prednisolone or Dexamethasone for Acute Exacerbations of Asthma: Do They Have Similar Efficacy in the Management of Exacerbations of Childhood Asthma?

PURPOSE OF THE STUDY. Prednisolone is the most commonly prescribed corticosteroid for asthma exacerbations; however, a 5-day course is normally required, and adherence may be an issue. Dexamethasone is a long-acting corticosteroid, and a 1-dose intramuscular or 1- or 2-dose oral course may be an alternative. How do these 2 treatments compare?

STUDY POPULATION/METHODS. A Medline search was performed which revealed 6 randomized trials that compared the efficacy of prednisolone and dexamethasone for use in pediatric asthma exacerbations.

RESULTS. There was some heterogeneity among the studies, with 3 comparing a single dose of intramuscular dexamethasone with a 3- to 5-day course of oral prednisolone, and 3 comparing 1 or 2 doses of oral dexamethasone with a 5-day course of oral prednisolone. None of the 6 studies reported any significant differences in efficacy for symptom scores, hospitalization rates, or relapse rates.

CONCLUSIONS. All 6 studies supported the claim that dexamethasone is just as effective as prednisolone.

REVIEWER COMMENTS. These studies seem convincing in suggesting that 1 dose of intramuscular dexamethasone or 1 or 2 doses of oral dexamethasone are as effective as a several-day course of prednisolone for asthma exacerbations, and this approach could clearly improve treatment adherence when this outcome may be in doubt.

Add-on Omalizumab in Children With Severe Allergic Asthma: A 1-Year Real Life Survey

PURPOSE OF THE STUDY. The goal of this study was to report the real-life efficacy and safety of add-on treatment with omalizumab in a large group of children with severe allergic asthma. The primary aim of this observational study was to evaluate the effect of omalizumab on asthma control. Secondary aims were to evaluate outcomes, including asthma exacerbations, health care utilization, inhaled corticosteroid (ICS)- sparing effect, pulmonary function test results, and safety.

STUDY POPULATION. A total of 104 children <18 years of age with severe allergic asthma and long-term follow-up at participating tertiary care centers who started omalizumab between January 2006 and June 2009 were enrolled.

METHODS. Baseline characteristics were collected from medical files. Data were collected prospectively during 3 separate visits, including at initial administration of omalizumab (V0), at 20 ± 4 weeks (V1), and 52 ± 4 weeks (V2). Data included the level of asthma control during the 4 weeks before each visit, exacerbations, health care utilization, pulmonary function test results, data on maintenance therapy and ICS dose, and adverse events.

RESULTS. Asthma control improved over the year of treatment with omalizumab. Rates of poor control were 82% at V0, 17% at V1, and 8% at V2, and rates of good control were 0% at V0, 53% at V1, and 67% at V2 (P < .0001). There was a 72% reduction in exacerbations and an 88.5% reduction in hospital admissions over the 1 year of treatment. There was a significant improvement in pulmonary function test results and a 30% reduction in ICS dose over the 1-year treatment. The only effect modifier observed for response to omalizumab was age (ie, age ≥12 years was associated with better control). Six patients discontinued omalizumab due to a serious adverse event.
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