Oral dexamethasone improved respiratory distress in children < 2 years of age with acute bronchiolitis

Schuh S, Coates AL, Binnie R, et al. **Efficacy of oral dexamethasone in outpatients with acute bronchiolitis.** J Pediatr. 2002 Jan;140:27-32.

QUESTION

In children < 2 years of age who present to the emergency department (ED) with acute bronchiolitis, what is the effectiveness of oral dexamethasone?

DESIGN

Randomized (allocation concealed*), blinded (clinicians, patients, data collectors, and outcome assessors),* placebo-controlled trial with follow-up at 4 hours and 7 days.

SETTING

The ED of a hospital in Toronto, Ontario, Canada.

PATIENTS

71 children who were between 8 weeks and 23 months of age, had a first wheezing episode associated with respiratory distress and an upper respiratory tract infection, and had a Respiratory Disease Assessment Instrument rating ≥ 6. Follow-up was 99% at 4 hours (mean age 6.5 mo, 61% boys) and 94% at 7 days.

INTERVENTION

36 children were allocated to a single dose of oral dexamethasone, 1 mg/kg, and 34 were allocated to placebo. At 0, 30, 60, and 120 minutes, all children received albuterol (Ventolin 5% solution, GlaxoSmithKline, Research Triangle Park, NC, USA) via nebulizer, 2.5 mg per dose (0.5 mL) in 3 mL normal saline and oxygen flow 6 to 7 L/min. After a 4-hour observation period, children were discharged home and continued to receive either daily oral dexamethasone, 0.6 mg/kg/dose, or placebo for 5 days, in addition to nebulized albuterol, 1.5 mg (0.3 mL) 4 times per day.

MAIN OUTCOME MEASURES

Main outcome was Respiratory Assessment Change Score (RACS), which assesses changes in retractions, wheezing, and respiratory rate measured from 0 to 240 minutes (a decrease in RACS indicates improvement, and an increase indicates deterioration). Secondary outcomes included hospitalization rates and RACS at 7 days.

MAIN RESULTS

Analysis was by intention to treat. Children who received dexamethasone had greater overall improvement in respiratory distress than did those who received placebo (mean RACS at 4 h −5.0 vs −3.2, $P < 0.03$). Fewer children who received dexamethasone had a poor response (i.e., RACS ≤ −2) than did those who received placebo (Table). The rate of hospitalization from the ED was lower in the dexamethasone group (Table). The groups did not differ for mean RACS at 7 days (−8.9 vs −9.3, $P = 0.75$).

CONCLUSION

In children < 2 years of age who presented to the emergency department with acute bronchiolitis, oral dexamethasone improved respiratory distress at 4 hours and reduced hospitalizations.

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*See Glossary.

Oral dexamethasone vs placebo for acute bronchiolitis in children < 2 years of age†

Outcomes at 4 h	Dexamethasone	Placebo	RRR (95% CI)	NNT (CI)
Poor response	17%	41%	60% (11 to 82)	5 (3 to 31)
Hospitalization	19%	44%	56% (9 to 80)	5 (3 to 36)

†Abbreviations defined in Glossary; RRR, NNT, and CI calculated from data in article.

COMMENTARY

Infants with acute bronchiolitis frequently present to pediatric EDs during the winter months and account for up to 17% of all infant hospitalizations in high prevalence areas (1). They have a variety of clinically indistinguishable pathologic conditions. Respiratory syncytial virus is associated with 60% of cases (2). Infants with first-time wheezing may be less likely to have asthma as an underlying cause than those with recurrent episodes. Most clinicians reserve glucocorticoids for recurring illness. Bronchodilators have yet to be definitively shown to be effective in decreasing hospitalizations from the ED in this population (3).

Shuh and colleagues restricted their methodologically strong study to infants with first-time wheezing of moderate severity presenting to an ED. They are the first to study glucocorticoid efficacy among nonhospitalized infants with presumed bronchiolitis. A family history of atopy, an indicator of asthmatic potential, was more prevalent in the dexamethasone group but did not affect the outcomes in a regression analysis.

Of the 2 dichotomous outcome measures, decreased hospitalization rate is clearest in its clinical significance. The decreased hospitalization achieved in the dexamethasone group was stable; only 1 delayed admission occurred among those discharged. Unscheduled cointerventions were more common in the placebo group. Adverse effects, although incompletely addressed, were not reported, despite the fact that the initial dose of dexamethasone was 40% higher than that used for croup. Although further study is warranted, many emergency clinicians and their patients are likely to accept an NNT as high as 36 to avoid hospitalization to justify administering at least a single oral dose of dexamethasone to infants with first-time wheezing.

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