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Q / Do corticosteroids reduce bronchiolitis hospitalizations?

EVIDENCE-BASED ANSWER

A / **No.** Corticosteroids alone don't decrease hospital admissions or length of stay among children with bronchiolitis (strength of recommendation [SOR]: **A**, meta-analysis of randomized controlled trials [RCTs]).

Combining oral dexamethasone and inhaled epinephrine appears to prevent one hospital admission for every 11 patients treated (SOR: **B**, single large RCT).

Evidence summary

A 2013 Cochrane review of 17 RCTs with 2596 patients compared corticosteroids with placebo for treating bronchiolitis in children younger than 2 years.[1] The studies used dexamethasone, prednisolone, prednisone, and budesonide delivered by oral, inhaled, intravenous (IV), or intramuscular (IM) routes, ranging between a one-day dose to a 5-day taper. Doses ranged from 0.5 to 2 mg/kg/d for oral and parenteral routes and 0.2 to 1 mg for inhalation. Outcomes were rate of admissions at Days 1 and 7 from outpatient trials and length of stay among inpatients.

Investigators found no significant difference in admission rates at Day 1 and Day 7 between children treated with corticosteroids compared with placebo (Day 1: 8 trials, 1762 patients; relative risk [RR]=0.92; 95% confidence interval [CI], 0.78-1.1; Day 7: 5 trials, 1530 patients; RR=0.86; 95% CI, 0.70-1.1). Length of hospital stay didn't differ between children treated with corticosteroids and children who received placebo (8 trials, 633 patients; mean difference= –0.18 days; 95% CI, –0.39 to 0.04).

Corticosteroid + epinephrine can lower hospital admissions

A 2009 multicenter, double-blind RCT with 800 patients (infants 6 weeks to 12 months of age with a first episode of bronchiolitis) that was included in the 2013 Cochrane review also compared the combination of epinephrine and corticosteroid with placebo and either agent alone.[2]

Infants were assigned to 4 groups: oral dexamethasone alone (1 mg/kg in the emergency room [ER] on Day 1, followed by 0.6 mg/kg daily for 5 days); nebulized epinephrine alone (2 treatments of 3 mL epinephrine 1:1000 solution); combined dexamethasone and epinephrine; and placebo. The primary outcome was hospital admission as long as 7 days after being seen in the ER.

Rates of admission were similar for the dexamethasone and placebo groups (25.6% vs 26.4%, respectively; RR=0.96; 95% CI, 0.69-1.3). The epinephrine group's rate of admission was 23.7% (RR=0.88; CI, 0.63–1.23). Only the dexamethasone-epinephrine group had a lower rate of admission compared with placebo (17% vs 26%; RR=0.65; 95% CI, 0.45-0.95). The number needed to treat with dexamethasone-epinephrine to prevent one hospital admission was 11.

Review prompts revised recommendations

Based on the Cochrane review, the American Academy of Pediatrics (AAP) revised its evidence-based clinical practice guideline in 2014 to recommend that clinicians not administer systemic corticosteroids to infants with a diagnosis of bronchiolitis in any set-

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ting (evidence quality **B**, strong recommendation, based on results of multiple RCTs).[3] The AAP advocates additional large trials to clarify whether combination therapy (corticosteroids plus agents with α or β agonist activity) is effective. JFP

References

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2. Plint AC, Johnson DW, Patel H, et al. Epinephrine and dexamethasone in children with bronchiolitis. *N Engl J Med.* 2009;360:2079-2089.
3. Ralston SL, Lieberthal AS, Meissner HC, et al. Clinical practice guideline: the diagnosis, management, and prevention of bronchiolitis. *Pediatrics.* 2014;134:e1474-e1502.