

Dexamethasone for mild croup

Clinical question

Does dexamethasone provide benefit to children with mild croup?

Article chosen

Bjornson CL, Klassen TP, Williamson J, et al. A randomized trial of a single dose of oral dexamethasone for mild croup. *N Engl J Med* 2004;351(13):1306-13.

Objective

To determine whether administration of a single oral dose of dexamethasone compared with placebo reduces the rate of return to a health care provider for croup within 7 days of treatment, and secondarily, to determine if it provides quicker resolution of croup symptoms in children with mild croup.

Background

Most studies demonstrating the effectiveness of dexamethasone treatment for croup have focused on patients with moderate to severe symptoms. However, most children suffering from croup have mild symptoms. The question is whether these patients would also benefit from dexamethasone treatment.

Population studied

Children 1–5 years of age, presenting to 1 of 4 Canadian pediatric emergency departments (EDs) with mild croup (defined as an onset within the previous 72 hours of a seal-like, barking cough and a score of 2 or less out of 17 points on the validated croup scoring system of Westley and colleagues¹) on an initial medical evaluation were included.

Study design

This study was a double-blind, multicentre, randomized controlled trial with blinded outcome assessors and data analysts. It used a concealed computer-generated randomization scheme, stratified by centre, using random permuted blocks of 6 to 10.

Outcomes measured

The primary outcome was a return to any health care

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provider for croup within 7 days of treatment. The secondary outcome was the presence of croup symptoms during the first 3 days following treatment. Patients were followed for 21 days after treatment. Other outcomes measured included economic costs, hours of sleep lost by the child, and the stress on the parent with respect to the child's illness.

Results

Of the 2901 patients assessed for eligibility, 720 were randomly assigned to dexamethasone ($n = 359$) or placebo ($n = 361$). There were no significant differences in disease severity or demographics between the 2 groups. Analysis was performed on the primary outcome data available for 354 patients in each group (98.6% in the treatment group and 98.1% in the control group) by the intention-to-treat principle. Patients in the dexamethasone group had fewer return visits compared with those in the placebo group (7.3% v. 15.3%); number needed to treat = 12.6 (95% confidence interval 8–13) as well as significantly fewer croup symptoms ($p = 0.003$). Treatment was well tolerated, with minimal vomiting after ingestion of the medication. The total average cost, loss of sleep and parental stress on the day following the ED visit were also all significantly less in the dexamethasone group.

Conclusions

The authors concluded that dexamethasone provides multiple small but consistent benefits in children presenting to the ED with mild croup and advocated its use in essentially all children with croup.

Commentary

Since the study was conducted in 4 Canadian EDs, the results have greater external validity than most primary stud-

Table 1. Croup scoring system of Westley et al¹

| Symptoms | Croup score | | | | |
|------------------------|-------------|--------------------------|-----------------------------|--------|---------|
| | 0 | 1 | 2 | 3 | 5 |
| Stidor at rest | None | Audible with stethoscope | Audible without stethoscope | – | – |
| Retractions | None | Mild | Moderate | Severe | – |
| Air entry | Normal | Decreased | Severely decreased | – | – |
| Cyanosis | None | With agitation | At rest | – | – |
| Level of consciousness | Normal | – | – | – | Altered |

ies involving clinical practice by Canadian emergency physicians.² The study focused on patients with mild disease, whereas most previous studies have focused on children with moderate to severe symptoms. The authors selected outcomes that were important to clinicians, health care administrators, patients and caregivers. Each outcome appeared improved with the dexamethasone treatment. A sensitivity analysis on the missing cases demonstrated the robustness of the results.

Although this study demonstrated that children with mild croup can benefit from treatment with a single dose of 0.6 mg/kg of dexamethasone, the authors point out that a smaller dose might be equally beneficial, as has been the finding in studies involving more severe cases.³ The smaller dose of 0.15 mg/kg has not been formally studied in the setting of mild croup, however, so that recommendation is not yet supported by the available evidence. The conclusion of this study is that 0.6 mg dexamethasone per kilogram of body weight (maxi-

um dose 20 mg) for patients with mild croup improves symptoms after discharge.

Key words: mild croup; dexamethasone; evidence-based medicine

Competing interests: None declared.

References

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