Corticosteroid Treatment for Acute Croup


SYSTEMATIC REVIEW SOURCE
This is a systematic review abstract, a regular feature of the Annals’ Evidence-Based Emergency Medicine (EBEM) series. Each features an abstract of a systematic review from the Cochrane Database of Systematic Reviews and a commentary by an emergency physician knowledgeable in the subject area.


The Annals’ EBEM editors prepared the abstract of this Cochrane systematic review as well as the Evidence-Based Medicine Teaching Points.

OBJECTIVE
To determine the effect of corticosteroids in the treatment of children with croup.

DATA SOURCES
The Controlled Trials Register of the Cochrane Library was searched; it includes studies identified by the Acute Respiratory Infection Review Group through the hand searching of key journals. In addition, studies were identified by searching MEDLINE, Excerpta Medica, and EMBASE (to August 1997). Reviewers wrote to study authors to inquire about published and unpublished articles. The review is considered updated to June 1999.

STUDY SELECTION
Studies were included if they were randomized controlled trials using any glucocorticoid therapy in the treatment of acute croup in children. Independent review of the trials was completed by 2 reviewers for possible relevance and then again for inclusion.

DATA EXTRACTION
One reviewer extracted data, and 2 reviewers independently assessed trial quality. Authors were contacted for missing data. Risk difference (RD), effect size (ES), and number needed to treat (NNT) with 95% confidence intervals (CIs) are reported.
EBEM/SYSTEMATIC REVIEW ABSTRACT

MAIN RESULTS

Twenty-four studies involving 2,221 patients were included in this updated review; 10 trials involved outpatients. Corticosteroid treatment was associated with an improvement in the croup severity score at 6 hours with an effect size of −1.0 (95% CI −1.5 to −0.6) and at 12 hours of −1.0 (95% CI −1.6 to −0.4); at 24 hours, this improvement was no longer significant (−1.0; 95% CI −2.0 to 0.1). There was a decrease in the number of adenalineline treatments needed in children treated with corticosteroids: a decrease of 9% (95% CI 2% to 16%) among those treated with budesonide and of 12% (95% CI 4% to 20%) among those treated with dexamethasone. There was also a significant decrease in the number of hours spent in the emergency setting (−11 hours; 95% CI −18 to 4), and inpatient hospital stay was reduced by 16 hours (95% CI −31 to 1 hour). Finally, patients discharged from the emergency department after corticosteroid treatment were less likely to relapse (0.46; 95% CI 0.35 to 0.61).

CONCLUSIONS

Both dexamethasone and budesonide are effective agents. Because corticosteroids (eg, predominantly dexamethasone) and inhaled budesonide are effective agents. Because its choice an easy one; dexamethasone is also the cheapest agent in this setting. Fortunately, the effectiveness of both other delivery routes provides the clinician with the option of using nebulized or intramuscular agents makes its choice an easy one; dexamethasone is also the cheapest agent in this setting. Fortunately, the effectiveness of both other delivery routes provides the clinician with the option of using nebulized or intramuscular agents in the face of complicated croup requiring admission or resulting in vomiting. What is not answered from this review is whether children with very mild croup benefit from corticosteroid therapy; further research in this setting is currently under way.

TAKE HOME MESSAGE

Treatment of croup with corticosteroids is an effective therapy for children seen in the ED with croup. Both systemic (oral, intramuscular) corticosteroids (eg, predominantly dexamethasone) and inhaled budesonide are effective agents. Because...
of their cost, the use of inhaled corticosteroids should be reserved for select patients (patients who cannot tolerate dexamethasone or oral intake).

EBEM Commentator Contact
Brian H. Rowe, MD, MSc
Division of Emergency Medicine
University of Alberta
1G1.63 WMC, 8440-112 Street
Edmonton, Alberta T6G 2B7 Canada
E-mail brian.rowe@ualberta.ca

EVIDENCE-BASED MEDICINE
TEACHING POINTS

Updates of Cochrane reviews. Cochrane reviews are regularly updated when new research information becomes available. This may be in the form of trials that were inadvertently missed in the original search or production of new research data. This feature of Cochrane reviews represents a major methodologic advantage compared with paper-based reviews, which are “old” at the time of publication. This feature permits reviews to be revised to reflect changes in the literature and is particularly important in emerging therapies.

NNT. Many methods are used to express the overall therapeutic benefit/harm in randomized trials and systematic reviews, including odds ratios (ORs), relative risks (RRs), P values, 95% CIs, and absolute and relative risk reduction. Debates rage regarding their strengths and weaknesses, which further confuse clinicians and readers of research. One alternative is to report the NNT, which is the inverse of the difference between the control event rate (CER) and the treatment event rate (TER). In a study in which the CER equals 25% (0.25) and the TER equals 12% (0.12), the NNT is 1/0.13 or 7.6. This number is rounded to 8, and the 95% CI is often also reported. The result represents the number of patients who would need to receive active treatment to prevent one adverse outcome.

REFERENCES