

Systematic Review Snapshot

TAKE-HOME MESSAGE

The use of 1 to 2 doses of dexamethasone for acute pediatric asthma exacerbation does not appear to increase the frequency of unscheduled return visits compared with a 5-day course of prednisone or prednisolone.

METHODS

DATA SOURCES

MEDLINE, through PubMed, was searched on October 19, 2013. Reference lists from included studies and relevant review articles were searched by hand.

STUDY SELECTION

Randomized controlled trials in any language, conducted in ambulatory or emergency department (ED) settings, were included if they compared dexamethasone with prednisone or prednisolone in the treatment of asthma exacerbation in patients aged 18 years or younger.

DATA EXTRACTION AND SYNTHESIS

Data were abstracted from the studies by 1 of 4 authors and verified by a second author. Abstracted data included subject characteristics, asthma severity score, treatments, adverse effects, and clinical outcomes. Study quality was assessed independently by 2 reviewers with the Cochrane risk of bias tool, the Jadad score,¹ and 2 additional items assessing for industry sponsorship and use of an intention-to-treat analysis. Results were pooled with a fixed-effects model, and heterogeneity was assessed with the I^2 statistic.

Is Dexamethasone as Effective as Prednisone or Prednisolone in the Management of Pediatric Asthma Exacerbations?

EBEM Commentators

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Results

Table. Pooled RR of relapse* for dexamethasone versus prednisone/prednisolone at various intervals.

Rate of Relapse	Days (95% CI)	
	5	10–14
RR	0.9 (0.46–1.78)	1.13 (0.77–1.67)

*Defined as an unscheduled return visit to the clinic or ED, or hospital admission.

Six studies were included in the final analysis, all of which were conducted in the ED. Overall quality was poor, with Jadad scores of 3 to 4 (of 8) for 5 of the studies and a score of 8 for a single study; study quality was limited primarily by a lack of blinding. Dexamethasone was administered as a single intramuscular dose in 3 studies, as a single oral dose in 1 study, and as multiple oral doses in 2 studies. The mean age of subjects was 53.2 months (95% confidence interval [CI] 41.5 to 64.9 months), and 63.5% were male patients. There was no difference in the rate of relapse between the 2 groups at 5 days or 10 to 14 days (Table). There was no heterogeneity between studies, with I^2 values of

0% for outcomes at both 5 and 10 to 14 days.

Commentary

Asthma is the most common chronic disease of childhood and is associated with considerable health care costs.² Although treatment with bronchodilators is typically used to reverse acute bronchoconstriction, corticosteroids are also a mainstay of therapy aimed at reducing inflammation and mucous plugging.³ Traditionally, corticosteroids have been prescribed as a 5-day course of either oral prednisone or prednisolone; the goal of this systematic review was to determine whether a

1- or 2-day dosing regimen of dexamethasone has similar efficacy.

The search strategy was not comprehensive; the authors did not search additional databases such as EMBASE, Scopus, or BioMed Central. Two additional unpublished clinical trials were identified by the authors, but attempts to contact the authors of these studies to include their data were unsuccessful. Among the studies that met the final inclusion criteria, there was significant variability in the doses of dexamethasone, prednisone, and prednisolone. Dexamethasone dosing ranged from 0.3 to 1.7 mg/kg, whereas prednisone and prednisolone doses ranged from 1 to 2 mg/kg. There was also variability in the maximum dose allowed for both dexamethasone (15 to 36 mg) and prednisone/prednisolone (20 to 100 mg). Finally, the quality of the included studies was rated as low: 4 of the studies were open label and the methodology was not properly reported in all but 1 study. Therefore, the pooled results must be interpreted with caution. A previous systematic review that included many of the same studies did draw similar conclusions to those of the authors.⁴

Medication nonadherence is a common problem⁵ and may affect asthma

control. In the meta-analysis, patients who received dexamethasone were less likely to vomit both in the ED (relative risk [RR] 0.29; 95% CI 0.12 to 0.69) and at home (RR 0.32; 95% CI 0.14 to 0.74) compared with patients who received prednisone/prednisolone. A recent study of pediatric asthma patients demonstrated that greater adherence to medications was associated with a lower likelihood of asthma-related ED visits.⁶ In addition, convenience has been identified as a leading factor affecting adherence in asthmatic patients.⁷ Despite the limitations of this systematic review, the simplified dosing strategy for dexamethasone is more convenient for patients and therefore may improve both adherence^{7,9} and other important, patient-centered outcomes.¹⁰

Editor's Note: This is a clinical synopsis, a regular feature of the *Annals*' Systematic Review Snapshot (SRS) series. The source for this systematic review snapshot is: Keeney GE, Gray MP, Morrison AK, et al. Dexamethasone for acute asthma exacerbations in children: a meta-analysis. *Pediatrics*. 2014;133:493-499.

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Michael Brown, MD, MSc, Alan Jones, MD, and David Newman, MD, serve as editors of the SRS series.