Dexamethasone Versus Prednisone for Pediatric Asthma: Will the results take your breath away?

Clinical Question: Are 1-2 doses of dexamethasone as effective as the standard five day prednisone regimen for treatment of pediatric asthma exacerbations?

Bottom-line: Treatment of pediatric asthma exacerbations with short-course dexamethasone (0.6 mg/kg x 1-2 doses) is a safe and effective alternative to traditional five day courses of prednisone. For every ~20 children treated with dexamethasone, there will be one less vomited dose.

Evidence:
- Systematic review of six Randomized Controlled Trials (RCTs) of pediatric asthma exacerbations: 1-2 doses of oral/intramuscular dexamethasone versus daily oral prednisone x5 days.¹
  - No difference in relapse rates (visit to Emergency Department (ED), clinic, or hospitalization) at any time.
  - Dexamethasone statistically significantly reduced vomiting in ED: 1.2% versus 5.3, Number Needed to Treat (NNT)=25.
      - Also, NNT=26 vomiting at home.
  - Limitations of systematic review: Study heterogeneity (dosages and routes of administration), most RCTs small, not blinded.
  - Largest RCT in systematic review: 628 children aged 2-18 years with ED asthma exacerbation.² Oral dexamethasone 0.6 mg/kg/day x2 days versus oral prednisone 2 mg/kg/day x5 days.
      - No difference in relapse, symptom improvement or re-hospitalization at day 10.
- 2015 RCT not in systematic review: 245 children aged 2-17 years with ED asthma exacerbation.³ Single dose oral dexamethasone 0.3 mg/kg versus oral prednisolone 1 mg/kg/d x3 days.
  - No difference:
      - Primary outcome: Day four Pediatric Respiratory Assessment Measure: 0.91 versus 0.91.
Hospital admission, length of admission, return to care, number of school or parental work days missed.
  - Vomiting of first dose: 0% dexamethasone versus 5.7% prednisolone, NNT=18.

Context:
- Systemic corticosteroids (versus placebo) for asthma exacerbations within one hour of ED presentation decreases hospital admissions (NNT=8).4
- In a palatability study, liquid dexamethasone scored 8.2 (out of 10, higher better) versus 5.0 for liquid prednisolone.5
- Two studies6,7 report that 79-88% of caregivers prefer 1-2 day over five day courses of steroids.
- Injectable dexamethasone solution may be given orally. Elixir (0.5 mg/ml) available by prescription.8,9
- The Canadian Pediatric Society lists both prednisone/prednisolone and dexamethasone as options for acute pediatric asthma exacerbations.10

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References:

Tools for Practice is a biweekly article summarizing medical evidence with a focus on topical issues and practice modifying information. It is coordinated by G. Michael Allan, MD, CCFP and the content is written by practicing family physicians who are joined occasionally by a health professional from another medical specialty or health discipline. Each article is peer-reviewed, ensuring it maintains a high standard of quality, accuracy, and academic integrity.

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