

Review: commonly used pharmacological treatments for bronchiolitis in children do not seem to be effective

King VJ, Viswanathan M, Bordley WC, *et al*. Pharmacologic treatment of bronchiolitis in infants and children: a systematic review. *Arch Pediatr Adolesc Med* 2004;**158**:127–37.

Clinical impact ratings GP/FP/Primary care ★★★★★☆☆ Paediatrics ★★★★★☆☆

Q In children with bronchiolitis, what is the effectiveness of commonly used pharmacological treatments?

METHODS



Data sources: Medline (January 1980 to November 2002), Cochrane Central Register of Controlled Trials, reference lists, and technical experts.



Study selection and assessment: single or double blinded randomised controlled trials (RCTs) published in English that evaluated pharmacological treatments for bronchiolitis in ≥ 10 children.



Outcomes: death, short and long term morbidity, and use of health services.

MAIN RESULTS

44 RCTs of commonly used interventions met the selection criteria. Study quality was rated as excellent in 7 RCTs, good in 20 RCTs, fair in 15 RCTs, and poor in 2 RCTs. *Nebulised epinephrine* (8 RCTs, 660 children). Epinephrine was better than salbutamol for reducing hospital admission or length of stay in 2 of 3 RCTs but did not differ from albuterol (1 of 1 RCT) or placebo (2 of 2 RCTs). 3 of 5 RCTs showed better clinical scores immediately after epinephrine treatment than after control treatment, but the difference did not persist at 24 and 36 hours (1 RCT). β_2 agonist bronchodilators (13 RCTs, 956 children). None of 7 RCTs showed a benefit for β_2 agonists in admission rates or duration of hospital stay. 3 of 12 RCTs showed short term improvement in clinical scores 30–60 minutes after nebulised bronchodilator therapy, and 1 RCT showed worse scores. Groups did not differ for hospitalisation when nebulised ipratropium bromide was compared with nebulised salbutamol (1 RCT) or used in combination with salbutamol or albuterol and compared with either drug alone or placebo (2 RCTs). *Parenteral corticosteroids* (2 RCTs [dexamethasone], 147 children). Groups did not differ for hospitalisation or clinical scores. *Oral corticosteroids* (5 RCTs, 273 children). 1 of 2 RCTs comparing dexamethasone with placebo showed a lower hospital admission rate for dexamethasone. 1 of 2 RCTs comparing prednisolone with placebo showed more hospital admissions with prednisolone. 1 RCT showed short term improvement in clinical scores for prednisolone plus albuterol compared with albuterol plus placebo, but the effect was not apparent at 3 or 6 days. *Inhaled corticosteroids* (6 RCTs, 492 children). 2 of 5 RCTs comparing budesonide with placebo or control showed longer term worsening of symptoms for budesonide (more wheezing and coughing at 12 mo and more hospital readmissions for respiratory problems at 6 mo). 1 RCT showed that 2 months of budesonide use reduced the need for asthma inhalation therapy at 2 years when compared with 7 days of budesonide use or usual symptomatic treatment. Fluticasone by metered dose inhaler (1 RCT) for 3 months led to less coughing at night at 36 weeks than did placebo, but the effect was not apparent at 3, 6, 12, or 24 weeks. *Ribavirin* (10 RCTs, 320 children). None of 4 placebo controlled RCTs showed a difference between groups for use

of healthcare services. 1 RCT that showed improvement used sterile water as the placebo which may itself induce bronchospasm. For clinical scores (6 RCTs), 1 RCT showed that ribavirin was better than placebo for time to improvement in cough or crepitations but not for wheezing or feeding. 2 RCTs showed better clinical scores for ribavirin than for placebo on some days but not on others. 1 long term RCT showed that fewer children had ≥ 2 wheezing episodes at years 1–6 after ribavirin than after water placebo, but groups did not differ for overall respiratory illness or symptoms. Another RCT showed that ribavirin led to fewer episodes of reactive airways disease and upper and lower respiratory disease than did usual treatment at 1 year.

CONCLUSION

In children with bronchiolitis, the evidence does not consistently show that commonly used pharmacological treatments are effective.

Commentary

King *et al* collated the English language literature for common pharmacological treatments of bronchiolitis and justifiably concluded that the routine use of these agents does not reliably improve clinical features, nor do they influence hospital admission or duration of hospital stay.

Why, then, do clinicians in some countries commonly treat children with bronchiolitis with bronchodilators? In part, it may be because unnecessary treatment is given for a condition that closely resembles asthma (despite a different pathogenesis).¹ Thus, it is necessary to increase awareness of the lack of reliable benefit of these treatments in bronchiolitis.

However, it also may be in part because short term improvements are frequently seen, albeit not consistently. For example, King *et al* described short term improvements in clinical scores in 4 of 7 studies where epinephrine was compared with placebo or albuterol. Also, 1 of 2 previous meta-analyses of bronchodilator treatment studies pooled clinical score data and found that the proportion of children with improved scores was higher in those receiving bronchodilators than in those receiving placebo.² The improvements may be related to non-bronchodilator effects, such as reduced airway resistance¹ or changes in state from sleep to wakefulness.² It is possible that short term improvements may be associated with other benefits such as improved feeding and reduced restlessness. Such improvements may be desired by clinicians and families even if the overall duration of illness is not reduced.

Future clinical trials could address whether a trial of pharmacological treatment (particularly bronchodilators) with defined short term evaluation of benefit (and discontinuation if none is found) improves overall quality of life during bronchiolitis. Given the lack of certain benefit of any pharmacological treatment, any future clinical trial must compare treatment(s) with placebo.

James D Kellner, MD
University of Calgary
Calgary, Alberta, Canada

1 Wohl ME, Chernick V. Treatment of acute bronchiolitis [editorial]. *N Engl J Med* 2003;**349**:82–3.

2 Kellner JD, Ohlsson A, Gadomski AM, *et al*. Bronchodilators for bronchiolitis. *Cochrane Database Syst Rev* 2000;(2):CD001266.

For correspondence: Dr V J King, University of North Carolina at Chapel Hill, Chapel Hill, NC, USA

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