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[Intervention Review]

Bronchodilators for bronchiolitis

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ABSTRACT

Background

Bronchiolitis is an acute, viral lower respiratory tract infection affecting infants and often treated with bronchodilators.

Objectives

To assess the effects of bronchodilators on clinical outcomes in infants with acute bronchiolitis.

Search methods

We searched the Cochrane Central Register of Controlled Trials (CENTRAL) (*The Cochrane Library* 2010, Issue 1) which contains the Acute Respiratory Infections Group's Specialized Register, MEDLINE (1966 to March week 2 2010) and EMBASE (2003 to March 2010).

Selection criteria

Randomized controlled trials (RCTs) comparing bronchodilators (other than epinephrine) with placebo for bronchiolitis.

Data collection and analysis

Two authors assessed trial quality and extracted data. Unpublished data were obtained from trial authors.

Main results

We included 28 trials (1912 infants) with bronchiolitis. In 10 inpatient and 10 outpatient studies, oxygen saturation did not improve with bronchodilators (mean difference (MD) -0.45, 95% confidence interval (CI) -0.96 to 0.05, n = 1182). Outpatient bronchodilator treatment did not reduce the rate of hospitalization (12% in bronchodilator group versus 16% in placebo, odds ratio (OR) 0.78, 95% CI 0.47 to 1.29, n = 650). Inpatient bronchodilator treatment did not reduce the duration of hospitalization (MD 0.06, 95% CI -0.27 to 0.39, n = 349). In seven inpatient and eight outpatient studies, average clinical score decreased slightly with bronchodilators (standardized mean difference (SMD) -0.37, 95% CI -0.62 to -0.13, n = 1006).

Oximetry and clinical score outcomes showed significant heterogeneity. Including only studies at low risk of bias significantly reduced heterogeneity measures for oximetry (I^2 statistic = 17%) and average clinical score (I^2 statistic = 26%), while having little impact on the overall effect size of oximetry (MD -0.38, 95% CI -0.75 to 0.00, $P=0.05$) and average clinical score (SMD -0.26, 95% CI -0.44 to -0.08, $P=0.005$).

Effect estimates for outpatients were slightly larger than for inpatients for oximetry (outpatients MD -0.57, 95% CI -1.13 to 0.00 versus inpatients MD -0.29, 95% CI -1.10 to 0.51) and average clinical score (outpatients SMD -0.49, 95% CI -0.86 to -0.11 versus inpatients SMD -0.20, 95% CI -0.43 to 0.03). Adverse effects included tachycardia and tremors.

Authors' conclusions

Bronchodilators do not improve oxygen saturation, do not reduce hospital admission after outpatient treatment, do not shorten the duration of hospitalization and do not reduce the time to resolution of illness at home. The small improvements in clinical scores for outpatients must be weighed against the costs and adverse effects of bronchodilators.

PLAIN LANGUAGE SUMMARY**Bronchodilators for bronchiolitis for infants and young children**

Bronchiolitis is an acute, highly contagious, viral infection of the lungs that is common in infants. It causes the small airways in the lungs to become inflamed, blocking the free passage of air so that the infant becomes breathless, wheezy and short of oxygen. Bronchodilators are drugs often used as aerosols to widen the air passages by relaxing the bronchial muscle. They are effective in helping infants and adults with asthma. However, unlike asthmatics, infants with bronchiolitis are usually wheezing for the first time and wheezing for a different reason, that is to say, because their airways are clogged with debris. Therefore, infants with bronchiolitis may be less likely to respond to bronchodilators.

This review of trials found no effect of bronchodilators on oxygen saturation. Some infants treated as outpatients showed a short-term improvement in respiratory scores, but infants hospitalized for bronchiolitis showed no significant benefit of bronchodilator treatment. This review also found that bronchodilators do not reduce the need for hospitalization, do not shorten the length of stay in hospital or shorten illness duration at home. Side effects of bronchodilators include rapid heart beat and shakiness. Given these side effects and little evidence that they are effective, bronchodilators are not helpful in the management of bronchiolitis.

This review is limited by the small number of studies that use the same outcomes. The small number of infants included in each of these studies limits the ability to show statistically important differences between bronchodilator and placebo treatment. This review is also limited by the use of clinical scores that may vary from one observer to the next. Also older studies included children who had wheezed before and may have asthma.