Continuous positive airway pressure (CPAP) for acute bronchiolitis in children

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Authors' objectives
Background: Acute bronchiolitis is one of the most frequent causes of emergency department visits and hospitalisation in infants. There is no specific treatment for bronchiolitis except for supportive therapy. Continuous positive airway pressure (CPAP) is supposed to widen the peripheral airways of the lung, allowing deflation of over-distended lungs in bronchiolitis. The increase in airway pressure also prevents the collapse of poorly supported peripheral small airways during expiration. In observational studies, CPAP is found to be beneficial in acute bronchiolitis.

Objectives: To assess the efficacy and safety of CPAP compared to no CPAP or sham CPAP in infants and children up to three years of age with acute bronchiolitis.


Selection criteria: We considered randomised controlled trials (RCTs), quasi-RCTs, cross-over RCTs and cluster-RCTs evaluating the effect of CPAP in children with acute bronchiolitis.

Data collection and analysis: Two review authors independently assessed study eligibility, extracted data using a structured proforma, analysed the data and performed meta-analyses.

Main results: We included two studies with a total of 50 participants under 12 months of age. In one study there was a high risk of bias for incomplete outcome data and selective reporting, and both studies had an unclear risk of bias for several domains including random sequence generation. The effect of CPAP on the need for mechanical ventilation in children with acute bronchiolitis was uncertain due to imprecision around the effect estimate (two RCTs, 50 participants; risk ratio (RR) 0.19, 95% CI 0.01 to 3.63; low quality evidence). Neither trial measured our other primary outcome of time to recovery. One trial found that CPAP significantly improved respiratory rate compared with no CPAP (one RCT, 19 participants; mean difference (MD) -5.70 breaths per minute, 95% CI -9.30 to -2.10), although the other study reported no difference between groups with no numerical data to pool. Change in arterial oxygen saturation was measured in only one trial and the results were imprecise (one RCT, 19 participants; MD -1.70%, 95% CI -3.76 to 0.36). The effect of CPAP on the change in partial pressure of carbon dioxide (pCO2) was also imprecise (two RCTs, 50 participants; MD -2.62 mmHg, 95% CI -5.29 to 0.05; low quality evidence). Duration of hospital stay was similar in both of the groups (two RCTs, 50 participants; MD 0.07 days, 95% CI -0.36 to 0.50; low quality evidence). Both trials reported no cases of pneumothorax and there were no deaths in either study. Change in partial pressure of oxygen (pO2), hospital admission rate (from emergency department to hospital), duration of emergency department stay, need for intensive care unit admission, local nasal effects and shock were not measured in either study.

Authors' conclusions: The effect of CPAP in children with acute bronchiolitis is uncertain due to the limited evidence available. Larger trials with adequate power are needed to evaluate the effect of CPAP in children with acute bronchiolitis. US:


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