Chest physiotherapy is of no benefit for infants with bronchiolitis


What is this review about?

The effect of chest physiotherapy on the respiratory and hospital outcomes of infants with acute bronchiolitis aged from 0 to 24 months.

What are the findings?

- Chest physiotherapy did not decrease severity or time to recovery (primary outcomes).
- Chest physiotherapy did not decrease duration of oxygen supplementation, length of stay, or parents’ impression of physiotherapy benefit.
Forced expiratory physiotherapy techniques were associated with adverse events.

**What are the findings based on?**

Twelve randomised controlled trials (n=1249) evaluated chest physiotherapy compared to no intervention. Trials took place in the United Kingdom, Spain, Brazil, France, Argentina, Israel, and Switzerland. Bronchiolitis was a clinical diagnosis, with one study also requiring children to be respiratory syncytial virus (RSV) positive. The maximum age recruited in any study was two years. Chest physiotherapy techniques of any type or frequency of administration were included. Chest physiotherapy was differentiated into conventional, forced passive expiratory, and slow passive expiratory techniques, and results are reported for these three types. Conventional techniques refer to percussion, vibration, and postural drainage of the thorax. Forced passive expiratory techniques involve the quick compression of the thorax or abdomen during expiration to increase expiratory flow. Slow passive expiratory techniques refer to the gradual application of compression to the thorax and abdomen, from the mid- to end of exhalation, to increase expiratory flow.

There was inconsistent frequency and timing of clinical severity status measurements across trials, varying from 15 minutes following intervention to the point of hospital discharge. A qualitative synthesis of included trials was performed because meta-analysis was not possible due to clinical heterogeneity and statistical considerations. Risk of bias for all studies is summarised in Figure 2.

The strongest evidence against the effectiveness of physiotherapy was for forced passive expiratory techniques from three trials (n=628). Across these trials there was low risk of bias,
predominantly due to one large higher quality trial (n=496). All trials evaluated the time taken to recovery or clinical stability, reporting no significant difference between groups. This was high quality evidence according to Grading of Recommendations Assessment, Development and Evaluation (GRADE). Two trials (n = 132) evaluated change in severity status, both reporting no significant difference between groups. The largest trial (n=496) reported an increased risk of respiratory destabilisation (RR 5.4, 95% CI 1.6 to 18.4) and vomiting (RR 10.2, 95% CI 1.3 to 78.8) in the group receiving forced passive expiratory physiotherapy. This evidence was of high quality according to GRADE in infants with severe bronchiolitis (n = 496).

Five trials (n=246) evaluated conventional techniques. Trials of conventional techniques had a high or uncertain risk of bias across all domains. All reported no significant difference in change in severity status. No trials evaluated time to recovery. Adverse events were inconclusive and not routinely recorded.

Four trials (n=375) evaluated slow passive expiratory techniques. Across trials of slow passive expiratory techniques, there was uncertain risk of bias due to reporting of trials. Of these, two trials reported no significant difference between groups in change in severity status. This was low quality evidence, according to GRADE, in moderate bronchiolitis. One small trial (n= 20) reported a significant effect between groups on short term respiratory scores immediately after administration. No trials evaluated time to recovery. Two trials (n=256) evaluated adverse events, finding no association. This was very low quality evidence, according to GRADE, in moderate to severe bronchiolitis.
Implications for practice

• Chest physiotherapy should not be routinely implemented in infants with acute bronchiolitis.

• Paediatricians and physiotherapists should educate referrers and parents regarding the lack of efficacy of chest physiotherapy and the potential for adverse events.

Clinical perspective

Bronchiolitis is a viral infection of the respiratory bronchioles, commonly caused by RSV. Infants frequently present to emergency departments and require hospitalisation for bronchiolitis. Infants hospitalised with bronchiolitis receive supportive care including safe provision of fluids and nutrition, oxygen therapy, and additional respiratory support as required.

Historically, routine care also involved the administration of chest physiotherapy. Chest physiotherapy describes a range of therapeutic techniques which aim to facilitate secretion clearance, bronchial drainage, and alveolar and lung inflation to optimise respiratory function. However recent best practice guidelines recommend against the use of chest physiotherapy in bronchiolitis because of a lack of evidence supporting its efficacy. Despite this guidance, some institutions and countries continue to administer chest physiotherapy.

This review is an update of an earlier Cochrane review, and includes three new trials from Spain and Brazil. The more recent trials evaluate the efficacy of slow and forced passive expiratory techniques, highlighting a shift in physiotherapy practice away from conventional
techniques. This review reinforces the recommendations from previous reviews that chest physiotherapy should not be routinely implemented because it is not effective in improving infant outcomes. In addition, fast expiratory techniques have an increased likelihood of adverse events in infants with severe bronchiolitis.

In the Cochrane review the authors conclude that uncertainty surrounding the effectiveness of slow passive expiratory techniques highlights the need for future research in this area. A tenuous argument is made for the need to evaluate these techniques in non-hospitalised infants and also in conjunction with salbutamol and hypertonic saline. A contrasting argument is that future trials of chest physiotherapy techniques, existing or newly developed, are not justified due to compelling evidence that the underlying respiratory pathophysiology of bronchiolitis is not improved. Research dollars would be better spent on implementation science that targets cultural and institutional barriers to the uptake of current bronchiolitis guidelines, to clinically translate evidence and minimise the inappropriate provision of chest physiotherapy.

Figure 2. 'Risk of bias' graph: review authors’ judgements about each methodological quality item presented as percentages across all included studies

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References


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