

CAHE JC Critically Appraised Article Summary

Journal Club Details

Date of submission	June 2009
Journal Club location	Flinders Medical Centre
JC Discipline/s	Physiotherapy
JC Facilitator	Merran Jones

Clinical Scenario

What evidence is there to support the use of deep breathing and coughing techniques in the management of chronic bronchitis?

Review Question/PICO/PACO

- P** Bronchitis
- I** Deep breathing and coughing as supervised by physiotherapist
- C** Percussion and vibration
- O** Secretion production and hospital length of stay

Article/Paper

Bellone A, et al. Chest physical therapy in patients with acute exacerbation of chronic bronchitis: Effectiveness of three methods. *Arch Phys Med Rehabil* 2000; 81:558-60.

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Article Methodology:	Randomised Clinical Trial
Returned JC on:	3 June 2009
By CAHE staff member:	Zuzana Machotka

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Ques No.	Yes	Can't Tell	No	Comments
1	✓			<p>Did the study ask a clearly focused question?</p> <p>To compare the short-term effects of postural drainage (PD), oscillating positive expiratory pressure (FLUTTER device) and expiration with the glottis open in the lateral posture (ELTGOL) on oxygen saturation, pulmonary function, and sputum production in patients with acute exacerbation of chronic bronchitis</p>
2	?			<p>Was this a randomised controlled trial (RCT) and was it appropriately so?</p> <p>All three techniques (PD, FLUTTER, ELTGOL) were received by the individual patients but in random order. There were no controls in this study therefore this study was a 'randomised clinical trial'</p>
3			✓	<p>Were participants appropriately allocated to intervention and control groups?</p> <p>The study states that 'each patient received FLUTTER, ELTGOL, and PD by the same respiratory therapist at about the same time of the day on separate days and in random order.' Patients were 'randomly assigned' to receive one of the three interventions for the first day and then received alternate treatments during the second and third visits. No other information on randomisation process was given.</p>
4			✓	<p>Were participants, staff and study personnel, 'blind' to participants' study group?</p> <p>Although interventions were done in 'random' order, the same physiotherapist administered the 30 minute intervention to each participant and each participant knew which intervention they were receiving at the time.</p>
5	✓			<p>Were all of the participants who entered the trial accounted for at its conclusion?</p> <p>There were no drop outs in this study of 10 patients with chronic bronchitis with acute exacerbation and this is reflected in the results and conclusion of the study.</p>
6		✓		<p>Were the participants in all groups followed up and data collected in the same way?</p> <p>Outcomes measure data was collected immediately after, and 15 minutes and 1 hour post intervention. Data collected included oxygen saturation (SaO₂), lung function tests (FEV1). SaO₂ was measured 'continuously' using a pulse oximeter, and FEV1 was measured using a pony spirometer. In addition total sputum wet weight was 'measured' in grams immediately after and at 1 hour post intervention. Information regarding who collected data was not reported.</p>
7			✓	<p>Did the study have enough participants to minimise the play of chance?</p> <p>No justification of participant numbers or power calculations was made.</p>

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Ques No.	Yes	Can't Tell	No	Comments
8				<p>How are the results presented and what is the main result?</p> <p>Results were presented in text form, no tables or graphs were used. Significant differences were calculated for SaO₂ and FEV1 during intervention and 1 hour post. No significant differences were found.</p> <p>All three techniques demonstrated significant increase in sputum production at the end of treatment session. However only the Flutter and ELTGOL intervention techniques continued to be significant at 1 hour post intervention</p> <p>Bottom line:</p> <p>Flutter and ELTGOL may have longer treatment effects compared to PD techniques in reference to increase sputum production.</p>
9			Poor	<p>How precise are these results?</p> <p>The study's methodology states measures [SaO₂ and FEV1] were collected at 15 minutes post intervention and this data is absent in the results section. In addition point measures such as confidence intervals and standard deviation measures were not reported. However P values were given for pre compared to 1 hour follow up on all outcome measures used.</p>
10				<p>Were all important outcomes considered so the results can be applied?</p> <p>The population used 10 participants with history of chronic bronchitis and who had an acute exacerbation ((refer to study for definitions). The study's definitions are appropriate for this population.</p> <p>Outcomes used (SaO₂, FEV1, sputum weight) are appropriate in a clinical setting.</p> <p>Interventions (FLUTTER, PD, ELTGOL) are appropriate for 'clinical ward' setting and are commonly used with low set up costs.</p> <p>Summary:</p> <p>Overall this was an appropriate study using appropriate interventions and outcomes that can be incorporated into an everyday clinical ward setting. The results reflect FLUTTER and ELTGOL may be more effective in terms of sputum production at 1 hour post treatment compared to PD. However all three interventions did not demonstrate significance in SaO₂ and FEV1 results post treatment. This could reflect the small sample size used, likewise the outcomes used may not be specific enough to detect change.</p>