Airway clearance physiotherapy improves quality of life in people with bronchiectasis


Question: Does regular airway clearance using an oscillating positive expiratory pressure (PEP) device improve quality of life, sputum volume, respiratory function, and exercise capacity in people with bronchiectasis? Design: Randomised, crossover, controlled trial with 3-month intervention periods separated by a 1-month washout period. Setting: Acute teaching hospital in Scotland. Participants: 20 adults with radiologically diagnosed bronchiectasis and chronic sputum expectoration, who were not performing regular physiotherapy for airway clearance. Smoking, asthma, emphysema, and cystic fibrosis were exclusion criteria. Interventions: While in the intervention arm, participants performed 20–30 minutes of airway clearance twice daily. Each session consisted of three cycles of 10 breaths through an oscillating positive expiratory pressure (PEP) device called the Acapella, followed by the forced expiratory technique and coughing. Each participant’s technique was reviewed by a physiotherapist monthly during the intervention arm. During the control arm, the device was retained by the investigators and participants performed no physiotherapy for airway clearance. Throughout the study, both groups received all other standard management including antibiotics when exacerbation criteria were met. Any changes to the participants’ usual medication regimen were noted. Outcome measures: The primary outcome was the Leicester Cough Questionnaire (LCQ) – a 19-point, patient-reported measure of the impact of cough severity on quality of life with three domains (physical, psychological, and social). Secondary outcomes included the St George’s Respiratory Questionnaire (SGRQ), 24-hour sputum volume, lung function, maximum respiratory pressures, and the incremental shuttle walk test, measured at the end of each intervention arm. Results: All participants completed the study with no adverse events during airway clearance. During the 3-month intervention period, the total LCQ score showed significantly greater improvement than during the control period: difference in medians for total LCQ score 1.3 points, p = 0.002. Each of the three domains within the LCQ also showed significant benefits. Other outcomes that showed significantly greater improvements due to the airway clearance intervention were the SGRQ (difference in medians 8.5 points, p = 0.005), 24-hr sputum volume (difference in medians 3 ml, p = 0.02), and the incremental shuttle walk distance (difference in medians 40 m, p = 0.001). The groups did not differ significantly on the remaining secondary outcomes. Conclusion: Regular airway clearance with oscillating PEP improves disease-related quality of life and exercise capacity in people with bronchiectasis.

Commentary

This is the first long-term randomised trial of airway clearance physiotherapy in bronchiectasis. Previous short-term trials have only identified improvements in measures of sputum clearance (Jones & Rowe 2005). Long-term changes in sputum production are difficult to interpret because, while an increase may indicate more effective clearance, it could also indicate a greater mucus load in the lungs. So, while Murray and colleagues identified an effect on 24-hr sputum volume, of greater importance are the improvements in quality of life and incremental walk test distance.

The trial was well designed. The use of a crossover design raises concerns about carryover effects. Although the authors report similar group characteristics before intervention periods 1 and 2, it would be more convincing to report similarity before treatment and control periods (eg, Hodgson et al 2007). The breathing regimen employed with the Acapella (3 sets of 10 breaths) was a small treatment stimulus compared to the 10 sets of 10 breaths utilised in traditional PEP therapy (Elkins et al 2006), even considering it was applied twice a day. Also, an advantage of the Acapella is its ability to provide oscillating PEP independent of gravity, but it is unclear whether this was utilised because the position of the participants was not described.

Despite the above issues, this paper provides much needed evidence to support the use of airway clearance physiotherapy as a maintenance strategy in this population. The worthwhile results in this mild patient group show that initiating airway clearance physiotherapy early in the disease process is appropriate. Patients with greater sputum production may have more to gain, so further trials with participants with more severe disease should be conducted. Such trials should employ blinded outcome assessment and a stronger treatment stimulus. Also, given the recent trend for measures of global satisfaction with treatment to be included in clinical trials (eg, Glinsky et al 2008, Kay et al 2008, Lau et al 2008), this could be reported, as could the proportion of participants who elect to continue with the intervention after completing the trial.

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References