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The Impact of Positive Expiratory Pressure Therapy on Hyperinflation in Patients With COPD
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Abstract
BACKGROUND: Lung hyperinflation is a typical clinical feature of patients with COPD. Given the association between breathing at elevated lung volumes and the manifestation of severe debilitating symptoms, therapeutic interventions such as positive expiratory pressure (PEP) therapy and its variations (temporary, oscillatory) have been devised to mitigate lung hyperinflation. However, the efficacy of these interventions remains to be conclusively demonstrated. METHODS: A systematic review with meta-analysis of randomized trials was conducted following the PRISMA guidelines. Seven databases were screened with no date or language restriction. Two authors independently applied eligibility criteria and assessed the risk of bias of included studies using the Cochrane risk-of-bias tool. Outcomes were lung hyperinflation measures detected through changes in inspiratory capacity (IC), functional residual capacity (FRC), total lung capacity (TLC), and residual volume (RV), as well as FEV1, FVC, dyspnea, and physical capacity. Pooled standardized mean differences (SMDs) or mean differences (MDs) and 95% CI were calculated using a random-effects model. RESULTS: Seven trials, all with a high risk of bias, were included. Compared to control group, RV significantly decreased (4 studies, n = 231; SMD-0.42 [95% CI-0.77 to-0.08], P = .02), dyspnea improved (n = 321, SMD-1.17 [95% CI-1.68 to-0.66], P < .001), and physical capacity increased (5 studies, n = 311; MD 30.1 [95% CI 19.2– 41.0] m, P < .001) with PEP therapy. There was no significant difference between PEP therapy and the control group in TLC, FVC, or FEV1. Only one study reported changes in inspiratory capacity as well as FRC. CONCLUSIONS: In patients with COPD, the effect of PEP therapy on lung hyperinflation is unclear owing to the non-consistent change in lung hyperinflation out-comes, insufficient data, and lack of high-quality trials. Dyspnea and physical capacity might improve with PEP therapy. © 2024 Daedalus Enterprises.

Author Keywords
COPD; hyperinflation; positive expiratory pressure; system-atic review

Index Keywords
breathing pattern, chronic obstructive lung disease, clinical feature, dyspnea, forced expiratory volume, forced vital capacity, functional residual capacity, human, hyperinflation, inspiratory capacity, lung artery pressure, lung function, lung volume, medical procedures, meta analysis, noninvasive ventilation, physical capacity, positive end expiratory pressure ventilation, positive expiratory pressure therapy, practice guideline, Preferred Reporting Items for Systematic Reviews and Meta-Analyses, prevalence, pulmonary hypertension, quality of life, residual volume, Review, self care, smoking, systematic review, total lung capacity, dyspnea; Dyspnea, Forced Expiratory Volume, Humans, Lung Volume Measurements, Pulmonary Disease, Chronic Obstructive, Residual Volume, Total Lung Capacity

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