

Effects of pursed-lip breathing and forward trunk lean postures on total and compartmental lung volumes and ventilation in patients with Chronic Obstructive Pulmonary Disease



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Abstract

Objective: To identify effects of pursed-lip breathing (PLB), forward trunk lean posture (FTLP), and combined PLB and FTLP on total and compartmental lung volumes, and ventilation in patients with chronic obstructive pulmonary disease (COPD).

Methods: Total and compartmental lung volumes, and ventilation during quiet breathing (QB) and PLB performed in an upright and forward trunk lean posture of 16 mild to moderate COPD patients were evaluated using an Optoelectronic plethysmography. End-expiratory lung volume and end-inspiratory lung volume were separated into ribcage (EELVRC, EILVRC) and abdomen (EELVAB, EILVAB), respectively. Tidal volume (VT) was separated into pulmonary ribcage (VTRCp), abdominal ribcage (VTRCa), and abdomen (VTAB) volume.

Results: EELVRC was significantly lower in PLBUP than QB-UP and those with FTLP ($P < 0.05$). EILV and EILVRC were significantly greater during PLB-FTLP and PLB-UP than those of QB ($P < 0.05$). PLB significantly and positively changed EELVAB, EELV, EILVAB, VTRCp, VTAB, and ventilation than QB ($P < 0.05$). UP significantly increased VTRCp, VTAB, and ventilation and decreased EELVAB, EELV, and EILVAB than FTLP ($P < 0.05$).

Conclusion: A combined PLB with upright or FTLP demonstrate a positive change in total and compartmental lung volumes in patients with mild to moderate COPD. PLB is more beneficial than QB in improving ventilation.

Biography

Tantisuwat A is an Assistant Professor in Physical Therapy at Chulalongkorn University, Thailand. Her research interests are chest wall motion and cardiopulmonary physical therapy. She acquired training experience in Opto-electronic Plethysmography (OEP) at BTS Bioengineering, Milan, Italy. Her recent publications include "Effects of Different Modes of Upper Limb Training in Individuals with Chronic Obstructive Pulmonary Disease: A Systematic Review and Meta-analysis" and "Effects of Breathing Exercises in Patients with COPD: Systematic Review and Meta-Analysis", both published in the Annals of Rehabilitation Medicine. Her study in COPD over the last four years was supported by The Thailand Research Fund.



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