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Title: Acute effects of different intensities of positive expiratory pressure on chest wall volumes in chronic stroke

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Body: Aims: To study the acute effects of different intensities of Positive Expiratory Pressure (PEP) on chest wall kinematics in chronic stroke patients. Methods: Sixteen chronic stroke patients (stroke group, SG, age 55.7±9.3 yrs, FEV_1:86±11.4%pred; FEV_1/FVC: 0.79±0.06), and 16 age-matched healthy subjects (control group, CG, age 56.3±9.8 yrs, FEV_1: 97.7±12.5%pred; FEV_1/FVC: 0.81±0.03) were studied by Optoelectronic Plethysmography. Total (CW) and compartmental (abdominal, ab, abdominal rib cage, RCa and pulmonary rib cage, RCp) chest wall volumes were measured during three random intensities of PEP (10, 15 and 20 cmH_2O) in three moments: quite breathing (QB), 5 minutes of each level of PEP with 30 minutes of rest between each intensity and recovery. Results: the increase in CW volume variation during PEP=10, 15 and 20 cmH_2O was lower in SG compared to CG (186 vs. 343%, 218 vs. 395%, 209 vs. 431%, respectively, $p<0.0001$). Operating volumes were significantly different: during PEP, end-expiratory CW volume decreased in CG and increased in SG, mainly due to the pulmonary rib cage compartment.

Conclusions: Application of PEP determines rib cage expansion in restricted SG patients, but intensities greater than 10 cmH_2O should be used with caution to avoid excessive lung hyperinflation.