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Title: Effects of high-repetitive single limb exercises (HRSLE) on functional exercise capacity in patients with COPD – Randomized controlled multicenter trial

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Body: Introduction: Single limb exercises (SLE) in the form of one-legged cycling induce significant increases in exercise capacity in patients with COPD. Up to date it is unknown whether changes in exercise capacity can be achieved by using the SLE concept performed as strength training with a high number of repetitions (HRSLE) for this group of patients. Aim: To evaluate the effects of HRSLE and patient education (PE) compared to PE alone on functional exercise capacity in patients with COPD Methods: Participants with COPD were recruited and randomized to eight weeks of HRSLE and PE or PE alone. Blinded measurements of functional exercise capacity measured by the 6-minute walk test (6MWT), the 6-minute pegboard and ring test (6PBRT) and the unsupported upper limb exercise test (UULEX) were performed. HRSLE is a strength training regimen performed with one leg /arm at a time alternating the left/right side using elastic bands and body weight as resistance with a high number of repetitions. Results: Forty-four patients with COPD [23 female; mean (SD) age: 68.7 (5.6) years; FEV₁ %predicted: 44.6 (9.7); BMI: 25.6 (4.4)] were included. The magnitude of change was greater in the HRSLE group in the 6MWT (mean difference: 32m, 95% CI 13 to 57m; effect size (ES) 2.2), the 6PBRT (mean difference: 20 rings, 95% CI 3 to 37 rings; ES 1.5) and the UULEX (mean difference: 118 sec, 95% CI 72 to 164 sec; ES 3.2). Conclusion: The present study shows that eight weeks of HRSLE improves upper and lower extremity functional exercise capacity in patients with moderate to severe COPD.