Minimal clinically important difference using one-repetition maximum in COPD

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Abstract

Peripheral muscle strength training is a key component of pulmonary rehabilitation (PR). However, the clinical interpretability of changes in muscle strength following PR is limited due to the lack of cut-off values to define clinical improvement. This study estimated the minimal clinically important difference (MCID) for leg extension (LE-MS) and chest press (CP-MS) muscle strength using one-repetition maximum (1-RM) in patients with COPD.

51 patients (44♂; 69.2±7.2yrs; FEV₁149.4±19.2%predicted) were included. 1-RM was measured on a multigym (BH Fitness G112X). The 6-minute walk test (6MWT) and the modified Medical Research Council (mMRC) dyspnoea scale were used as anchors. All measures were assessed pre/post 12-weeks of PR. MCID were calculated using anchor- and distribution-based methods. Pooled values were obtained using Meta XL with a quality effects model weighting 2/3 for anchor and 1/3 for distribution-based methods.

Significant correlations were only found between the LE-MS and the 6MWT ($r=.309$; $p=.028$). The pooled of the anchor- and distribution-based methods resulted in a MCID of 5.14kg for LE-MS and 6.25kg for CP-MS (Fig. 1).

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Improvements of approximately 5 and 6kg in LE-MS and CP-MS, respectively, were identified as clinically relevant. Only distribution-based methods could be used to compute the MCID for CP-MS, which could have overestimated this value. Studies with larger samples are needed to consolidate these results.

Footnotes

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