Abstract

Background

Chronic obstructive pulmonary disease (COPD) is one of the leading causes of death in the world. Current evidence suggests pulmonary rehabilitation to be the most effective therapeutic strategy to improve health status in this population. With the current COVID-19 pandemic and the poor uptake of pulmonary rehabilitation for various reasons, a home-based rehabilitation programme could potentially improve uptake and adherence of exercise in patients with COPD. Hence, an outcome measure that is suitable to be carried out in home settings will also be required for assessing the effectiveness of such a programme.

Purpose

The one-minute sit-to-stand test could be useful in determining the effectiveness of a remote exercise-based programme as patients can easily perform it within their home settings. As part of the validation process, the aim of this study was to calculate the minimal clinically important difference (MCID) for the one-minute sit-to-stand following a remote exercise-based intervention.

Methods

A comprehensive remote exercise-based intervention was developed at St Thomas' Hospital, UK for patients with COPD. The one-minute sit-to-stand, COPD Assessment Test and Medical Research Council dyspnoea scale were completed before and after the exercise programme. Participants were asked to score their change in health status after the programme using the Global Rating of Change questionnaire. Data were analysed retrospectively. Anchor-based methods were used to evaluate the MCID of the one-minute sit-to-stand test for remote exercise-based interventions.

Results

In total, complete data were available from 107 patients with COPD who completed the one-minute sit-to-stand before and after their remote exercise-based programme. The remote exercise-based intervention was effective, with statistically significant improvements in exercise capacity and quality of life outcomes between baseline and post-intervention. The median (range) improvement of the one-minute sit-to-stand test after the programme was 3 (1-5) repetitions. Changes in one-minute sit-to-stand repetitions were only weakly correlated with changes in the dyspnoea scale, COPD assessment test and the Global Rating of Change questionnaire (ρ=-0.151, -0.117 and 0.087, respectively). Furthermore, there was no significant correlation between changes in the one-minute sit-to-stand test and the selected patient-reported outcomes. Using anchor-based approaches, the estimated MCID for the one-minute sit-to-stand test was three repetitions.

Conclusions

The one-minute sit-to-stand is responsive to a remote exercise-based intervention. Results suggested an improvement of at least three repetitions to be clinically meaningful. However, further studies are required to confirm this MCID. Since the one-minute sit-to-stand test only displayed weak and statistically non-significant associations with the selected external anchors, anchors that display stronger correlations will be required to increase the robustness of the MCID estimates.

Implications

The one-minute sit-to-stand test was found to be responsive to changes following remote exercise-based interventions in patients with COPD. This suggests that it could be used as an alternative to the other field tests that require more space, highly trained staff or specialist equipment for assessing the effectiveness of home-based interventions. The MCID provides a starting point for ensuring that changes are clinically important, although further testing with alternative anchors is needed to clarify this finding.