

Effects of home-based pulmonary rehabilitation on the functional status of patients with exacerbations of COPD: a randomized controlled trial

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Exacerbations of chronic obstructive pulmonary disease (ECOPD), which are defined as an acute worsening of respiratory symptoms that result in additional therapy, have a negative impact on patients' functional status and disease progression. Pulmonary rehabilitation (PR) is a well-established intervention for the management of patients with stable disease, however uncertainty exists about the safety and beneficial effects of delivering PR for patients with ECOPD. This study aimed to explore the safety and effects of a home-based PR programme on the functional status of outpatients with ECOPD.

A randomized controlled trial was conducted (NCT03751670). Patients with ECOPD were randomly assigned to the control (CG, i.e., standard medication) or experimental (EG, i.e., standard medication plus 3-weeks [2 times/week] of PR) group within 48h of the diagnosis (baseline). The PR programme was composed of breathing control exercises, airway clearance techniques, exercise training and psychoeducational support. Functional status was assessed at baseline and after 3 weeks (post) through the London chest activities of daily living scale (LCADL), short physical performance battery (SPPB), quadriceps muscle strength (QMS) and 1-minute sit-to-stand test (1-minSTS). Comparisons within and between groups were explored with (non-)parametric mixed ANOVAs.

Fifty outpatients with ECOPD (78% male, 69.7±10.7 years, FEV₁ 47.4±16.4%predicted) were included. Between groups comparisons showed a significant group*time interaction for LCADL (CG: baseline 24.5 [19; 39] vs. post 27 [16; 39], EG: 23 [17.5; 39] vs. post 18.5 [13; 30], p=0.006), SPPB (CG: baseline 9 [8; 11] vs. post 10 [8; 11], EG: 9 [7.5; 10] vs. post 10 [9; 11.5], p=0.049) and QMS (CG: baseline 23.4±7.3 vs. post 23.1±7.8 kgf, EG: baseline 22±6 vs. post 26±6.8 kgf, p<0.001), but not for the 1-minSTS (CG: baseline 17 [14; 25] vs. post 18 [14; 26] repetitions, EG: baseline 16.5 [12.5; 22] vs. post 22 [17.5; 25] repetitions, p=0.061). The EG presented significant

improvements, after PR, on all functional status measures ($p < 0.05$). No significant within group differences were found for the CG ($p > 0.05$). No adverse events were reported.

A 3-weeks home-based PR programme is safe and more effective than only standard medication in improving the functional status of outpatients with ECOPD. This highlights the potential role of PR in improving the recovery process during ECOPD and might contribute to improved prognosis in these patients. Future larger studies are needed to confirm these findings and assess the mid- and long-term effectiveness of PR in outpatients with ECOPD.

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