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Effects of pulmonary rehabilitation during acute exacerbations of COPD

Uncertainty exists about the safety and beneficial effects of delivering pulmonary rehabilitation (PR) during acute exacerbations of COPD (AECOPD). We explored the effects of a home-based PR programme during moderate AECOPD.

A randomized controlled trial was conducted (NCT03751670). Patients with AECOPD were randomly assigned to the control (CG, i.e., standard medication) or experimental (EG, i.e., standard medication plus 3-weeks of PR [breathing control, airway clearance, exercise, psychoeducational support]) group within 48h of the diagnosis (baseline). Symptoms (COPD assessment test, London chest activities of daily living, functional assessment of chronic illness therapy–fatigue), handgrip and quadriceps muscle strength, and functional capacity (short physical performance battery, 1-minute sit-to-stand test, Chester step test) were assessed at baseline and after 3 weeks. Comparisons within/between groups were explored with (non-)parametric mixed ANOVAs.

We included 44 patients (77% male, 68±10yrs; FEV_1 48±18%pred). After 3 weeks, the EG presented significant improvements in all outcomes; symptoms and muscle strength improved significantly in the EG in comparison to the CG (Table 1). No adverse events were reported.

A 3-weeks home-based PR programme is safe and more effective than only standard medication in improving patients' symptoms and muscle strength during recovery of moderate AECOPD, outcomes often associated with poor prognosis.

Table 1 – Effects of a 3-weeks home-based pulmonary rehabilitation programme during acute exacerbations of chronic obstructive pulmonary disease.

Outcome measure	Experimental group (n=23)		Control group (n=21)		Group*Time interaction
	Pre	Post	Pre	Post	
CAT total	23.4±7.1	11.5±6.1*	22.5±6.4	17±9.1*	**0.009**
LCADL total	28 [18; 40.5]	20 [13; 32.5]*	24 [19; 39]	24 [16; 39]	**0.003**
FACIT-F total	30 [22; 32.5]	20 [13; 32.5]*	24 [21; 34]	30 [22; 43]	**0.011**
Handgrip (kgf)	22.7±10.1	24.5±9.7*	26.4±10.9	25.4±9.7	**0.007**
QMS (kgf)	21.7±5.3	25.5±6.8*	23±7.9	23±8.8	**0.005**
SPPB	9 [7.5; 10]	10 [9; 11]*	9 [8; 11]	10 [8; 11]	0.315
1-minSTS (reps)	16 [12.5; 21.5]	20 [17.5; 23]*	17 [14; 19]	18 [14; 26]*	0.281
CST (steps)	14 [6.5; 29]	33 [17.5; 42.5]*	30 [16; 36]	35 [27; 70]*	0.186

Data are presented as mean±standard deviation or median [1st quartile; 3rd quartile]. Bold denotes a significant group*time interaction. *significant time effect (pre vs. post).
1-minSTS, 1-minute sit-to-stand test; CAT, COPD assessment test; CST, Chester step test; FACIT-F, functional assessment of chronic illness therapy–fatigue; LCADL, London chest activities of daily living; QMS, quadriceps muscle strength; Post, assessment after 3 weeks; Pre, assessment within 48h of the exacerbation diagnosis; SPPB, short physical performance battery.