

Pulmonary rehabilitation is successful in mild Chronic Obstructive Pulmonary Disease

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Abstract

Pulmonary rehabilitation (PR) is effective in improving health-related quality of life of patients with moderate-to-very-severe COPD. However, the effects of PR in patients with mild COPD have been scarcely explored. The overall findings show that PR improves exercise tolerance, dyspnea, muscle strength, physical activity and health-related quality of life in patients with mild COPD, and that most of these benefits last for at least 6 months. This study is a relevant step towards the integration of PR as part of the first-line management of patients with mild COPD.

Background

Chronic Obstructive Pulmonary Disease (COPD) is a highly incapacitating disease. It is well established that pulmonary rehabilitation (PR) is effective in improving dyspnea and health-related quality of life of patients with moderate-to-severe COPD.¹ However, the effects of PR in patients with mild COPD have been scarcely explored. This has been identified by the latest American Thoracic Society/European Respiratory Society official statement on PR as a major issue to be addressed.²

Aim

This study investigated the short- and long-term effects of PR in patients with mild COPD.

Methods

This was single-arm longitudinal study. A 12-week PR program with exercise training (3*week during 60 minutes) and psychoeducation (1*week during 90 minutes) was conducted.

Outcome measures at baseline, post-PR, 3 and 6 months were:

- 6-minute walk test (6MWT) for exercise tolerance;
- modified British Medical Research Council questionnaire (mMRC) for dyspnea;
- 1-repetition maximum on the knee extension exercise for peripheral muscle strength;
- Brief physical activity assessment for self-reported physical activity;
- St. George's Respiratory Questionnaire (SGRQ), with its 3 domains (symptoms, activities and impact) for health-related quality of life.

Descriptive statistics were used to describe the sample. One-way analysis of variance (ANOVA) with repeated measures and pairwise comparisons using Bonferroni correction was used to test for differences in outcome measures over time.

Results

A total of 32 patients with mild COPD completed the PR program (Table 1).

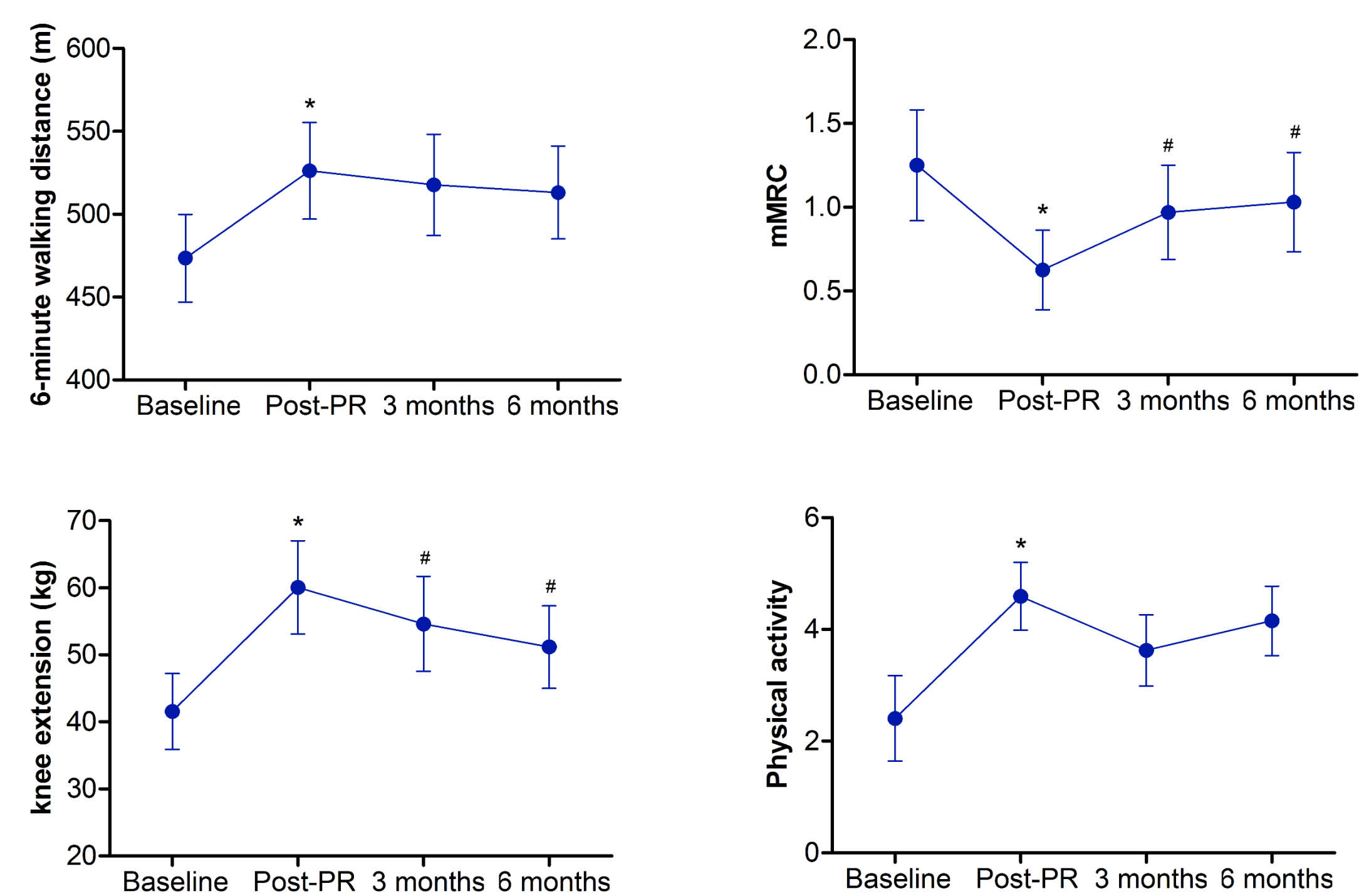
Table 1. Patients' characteristics.

Characteristics	Value
Age (mean ± SD) yrs	65.9 ± 8.9
Male / Female	22 / 10
Forced expiratory volume in 1 second (mean ± SD) % predicted	86.7 ± 5.17

There was a significant effect across the four time points for all the outcome measures (all $p < 0.015$), except for SGRQ impact score ($p = 0.711$).

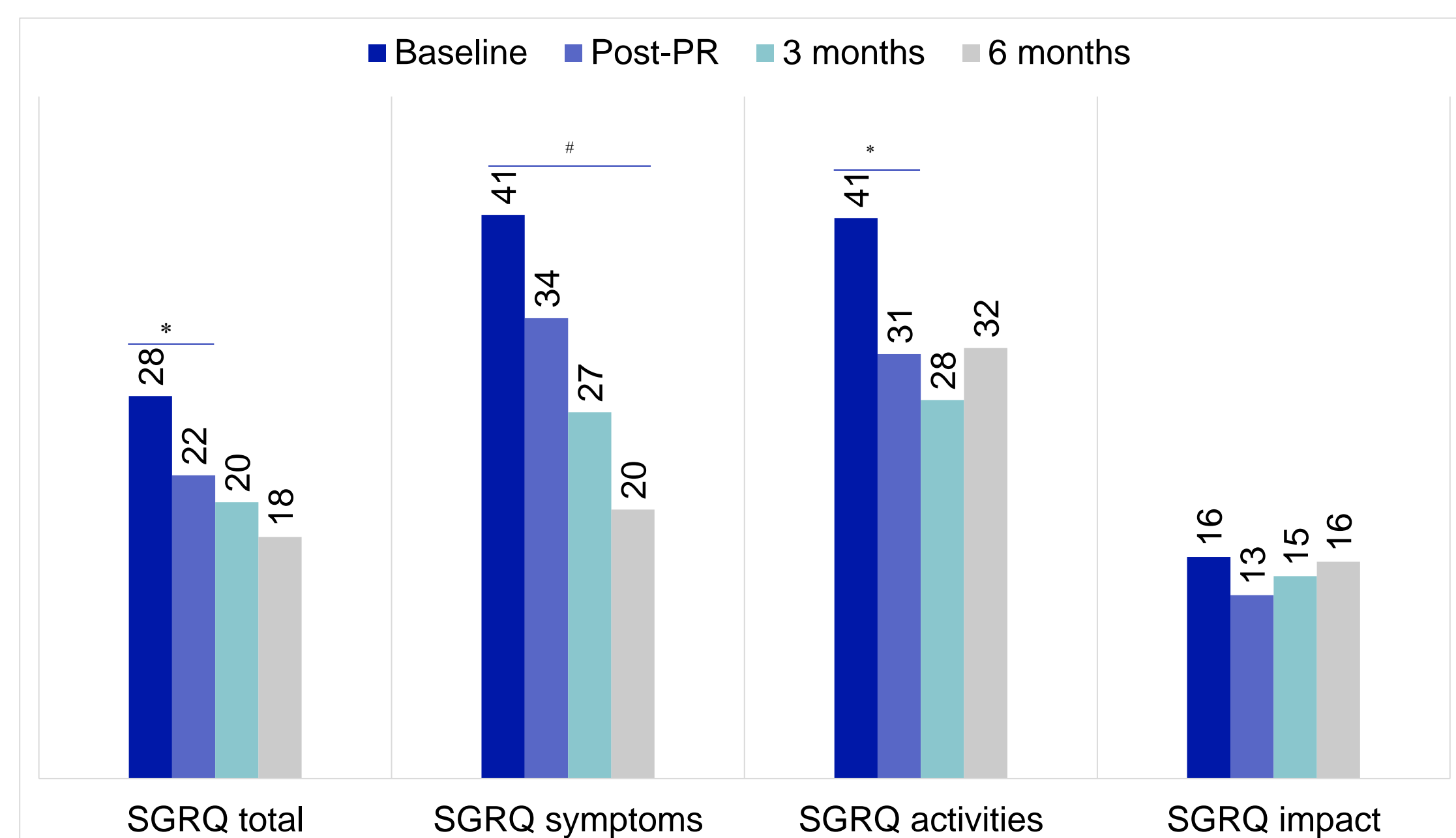
After PR, significant improvements in the 6MWT, mMRC, knee extension, self-reported physical activity (Graph 1), SGRQ total and activities scores (Graph 2) were observed (all $p < 0.016$). In addition, there was an improvement in SGRQ symptoms score from post-PR to 6 months ($p = 0.011$) (Graph 2).

Excluding mMRC and knee extension, the achieved benefits were sustained at 3 and 6 months (all $p > 0.05$, Graphs 1 and 2).



Graph 1 / Effects of the Pulmonary Rehabilitation program on the 6-minute walking distance, modified British Medical Research Council questionnaire, knee extension exercise and physical activity levels (n=32).

* $p < 0.05$ from baseline to post pulmonary rehabilitation
$p < 0.05$ from post pulmonary rehabilitation to 6 months



Graph 2 / Effects of the Pulmonary Rehabilitation program on patients' health-related quality of life (n=32).

* $p < 0.05$ from baseline to post pulmonary rehabilitation
$p < 0.05$ from post pulmonary rehabilitation to 6 months

Conclusion

PR improves exercise tolerance, dyspnea, peripheral muscle strength, physical activity and health-related quality of life in patients with mild COPD, and most of these benefits last for at least 6 months. These data suggest that PR should be part of the first-line management of patients with mild COPD.

References

- Lacasse Y, Goldstein R, Lasserson TJ and Martin S. Pulmonary rehabilitation for chronic obstructive pulmonary disease. Cochrane Database Syst Rev. 2006; Art. No.: CD003793.
- Spruit MA, Singh SJ, Garvey C, et al. An Official American Thoracic Society/European Respiratory Society Statement: Key Concepts and Advances in Pulmonary Rehabilitation. Am J Respir Crit Care Med. 2013; 188: e13-e64.