

## EDITORIAL

## Pulmonary rehabilitation after an exacerbation of chronic obstructive pulmonary disease – Evidence for the applicability of trial results to practice populations

**Key words:** chronic obstructive pulmonary disease, evidence-based medicine, exacerbation, practice guidelines, rehabilitation.

**Abbreviation:** COPD, chronic obstructive pulmonary disease.

Pulmonary rehabilitation after an exacerbation of chronic obstructive pulmonary disease (COPD) has received much attention recently.<sup>1</sup> There are a number of compelling reasons to refer patients to pulmonary rehabilitation after a COPD exacerbation. For example, patients with a history of exacerbations typically experience burdensome symptoms, have limited exercise capacity, and have decreased social and professional interactions. Pulmonary rehabilitation substantially improves these outcomes.<sup>2</sup> Also, the period after an exacerbation provides a potential window of opportunity for triggering behavioural changes that can lower the risk for exacerbations. In the period after an exacerbation, patients are likely to be more receptive to change their behaviour in daily life. During pulmonary rehabilitation, patients learn to recognize symptoms of an exacerbation early and act upon these symptoms appropriately. Also, patients receive a structured training programme and learn how to become more active physically.

Interestingly, referral of COPD patients to pulmonary rehabilitation after a COPD exacerbation has always been more common than referral when in a stable state in European countries (Germany, Austria, Italy and Switzerland). However, most randomized trials comparing pulmonary rehabilitation after a COPD exacerbation with usual post-exacerbation care have come from countries where pulmonary rehabilitation for individuals in a stable state is or has been the default (e.g. Belgium, England, Canada, New Zealand).<sup>3</sup> It is likely that such randomized trials are easier to justify to institutional ethics committees in countries where pulmonary rehabilitation after a COPD exacerbation is not standard practice.<sup>4</sup>

In this issue of *Respirology*, Revitt and colleagues present the results of a study that tested the feasibility and effects of a relatively short outpatient pulmonary rehabilitation programme after a COPD exacerbation that was implemented into a routine clinical rehabilitation programme service.<sup>5</sup> The study did not have a control group but compared the incidence of hospital admissions before and after patients followed the pulmonary rehabilitation programme, and also captured commonly used outcomes, such as exercise capacity and health-related quality of life. The results are highly relevant for settings where pulmonary rehabilitation

after a COPD exacerbation is not yet implemented. The well-performed study showed that it is feasible to implement such a programme into a routine clinical rehabilitation programme service with completion rates (74%) that are comparable to those observed in randomized trials (77% across trials).<sup>3</sup> As in the randomized trials, Revitt and colleagues observed a reduction in hospital admissions, although less pronounced than in randomized trials, while the effects on exercise capacity and health-related quality of life were similar. When controlling for the clustering of exacerbations in certain patients (by negative binomial regression analysis), the incidence rate ratio still indicated a positive effect of pulmonary rehabilitation on hospital admissions (0.84, 95% confidence interval: 0.66–1.06), although the change from the pre- to the post-exacerbation period was not statistically significant. There are a number of possible explanations for the smaller effect observed compared with the effect of pulmonary rehabilitation on hospital admissions reported from randomized trials. Small randomized trials tend to overestimate treatment effects. Also, patients are often, for reasons of efficiency, selected for randomized trials in whom effects are likely to be detected if they exist. On the other hand, there may be some misclassification of hospital admissions in the study by Revitt, which may have led to an underestimation of the incidence rate ratio.

Overall, the results of the study by Revitt indicate good applicability of the results from randomized trials to a less selected group of COPD patients from clinical practice, and the feasibility of outpatient pulmonary rehabilitation in COPD patients after an exacerbation. This is important because applicability of results to patients from real-world settings is an important criterion to rate the quality of evidence about an intervention, and may lend support to recommending such an intervention in clinical practice guidelines.<sup>6</sup>

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