



Pulmonary rehabilitation in severe COPD with hyperinflation: some insights into exercise performance

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We would like to highlight the importance of the study entitled "Exercise performance and differences in physiological response to pulmonary rehabilitation in severe chronic obstructive pulmonary disease with hyperinflation",⁽¹⁾ which was recently published in the JBP. The authors evaluated the impact of pulmonary rehabilitation on exercise tolerance in severe COPD with hyperinflation. That study showed improvement in oxygen consumption, reduced carbon dioxide production, and decreased respiratory drive; however, patients with post-exercise hyperinflation did not improve their maximal performance. We congratulate the authors for the important findings, but some key issues need to be taken into account for a proper clinical extrapolation.

First, it is unclear whether those patients with hyperinflation after exercise had peripheral muscle weakness prior to pulmonary rehabilitation or not. Second, we wonder if hyperinflation was significantly higher in those patients when they were compared with those who responded to pulmonary rehabilitation. In this line, a possible evaluation tool would be the handgrip, as demonstrated by Burtin et al.,⁽²⁾ who evaluated patients with COPD and showed what could be a tool associated with a prognosis of mortality in this population. Third, the authors evaluated the chest wall with the utilization of optoelectronic plethysmography; however, the

respiratory muscles were not evaluated directly, which would be an interesting factor given the fact that there are studies demonstrating that the sensation of dyspnea might be associated with respiratory muscle weakness, and the training of these muscles, in association with pulmonary rehabilitation, results in a reduction in dyspnea indices.⁽³⁾ We consider that other alternatives for COPD patients with chronic hyperinflation after exercise and submitted to a pulmonary rehabilitation program should be evaluated in this population. As an example, Monteiro et al.⁽⁴⁾ showed that the use of expiratory positive airway pressure in patients with moderate and severe COPD can reduce dynamic hyperinflation after a submaximal exercise. Similarly, Wibmer et al.⁽⁵⁾ evaluated the lung volumes in COPD patients undergoing exercise with the use of positive expiratory pressure via a nasal mask; the authors demonstrated a significant reduction in dynamic hyperinflation during a walking exercise.

We must highlight the importance of the study by Albuquerque et al.,⁽¹⁾ since COPD patients with post-exercise hyperinflation are a reality in outpatient rehabilitation, and adequate knowledge of the response to treatment is of great importance so that new studies with a focus on actions that can alleviate this condition can be carried out. In addition, further prospective clinical trials need to confirm such data.

REFERENCES

1. Albuquerque AL, Quaranta M, Chakrabarti B, Aliverti A, Calverley PM. Exercise performance and differences in physiological response to pulmonary rehabilitation in severe chronic obstructive pulmonary disease with hyperinflation. *J Bras Pneumol.* 2016;42(2):121-9. <http://dx.doi.org/10.1590/S1806-37562015000000078>
2. Burtin C, Ter Riet G, Puhan MA, Waschki B, Garcia-Aymerich J, Pinto-Plata V, et al. Handgrip weakness and mortality risk in COPD: a multicentre analysis. *Thorax.* 2016;71(1):86-7. <http://dx.doi.org/10.1136/thoraxjnl-2015-207451>
3. Beaumont M, Mialon P, Le Ber-Moy C, Lochon C, Péran L, Pichon R, et al. Inspiratory muscle training during pulmonary rehabilitation in chronic obstructive pulmonary disease: A randomized trial. *Chron Respir Dis.* 2015;12(4):305-12. <http://dx.doi.org/10.1177/1479972315594625>
4. Monteiro MB, Berton DC, Moreira MA, Menna-Barreto SS, Teixeira PJ. Effects of expiratory positive airway pressure on dynamic hyperinflation during exercise in patients with COPD. *Respir Care.* 2012;57(9):1405-12. <http://dx.doi.org/10.4187/respcare.01481>
5. Wibmer T, Rüdiger S, Heitner C, Kropf-Sanchen C, Blanta I, Stoiber KM, et al. Effects of nasal positive expiratory pressure on dynamic hyperinflation and 6-minute walk test in patients with COPD. *Respir Care.* 2014;59(5):699-708. <http://dx.doi.org/10.4187/respcare.02668>

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