LETTER TO THE EDITOR

Inspiratory muscle training in chronic obstructive pulmonary disease. Where are we?

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We read with great interest the study by Battaglia et al.1 which assessed the effectiveness of a new volumetric exerciser for improving some respiratory function parameters in patients with COPD. The purpose of this letter is to comment on what we consider to be important about the effectiveness of inspiratory muscle training (IMT) for improving the strength and endurance of respiratory muscles. Various studies in recent years have assessed the effectiveness of IMT for improving the strength and endurance of respiratory muscles in patients with COPD. When Threshold IMT equipment was not yet available commercially, Smith et al.2 published the first meta-analysis on the effects of IMT on the strength and endurance of the respiratory muscles, and the exercise capacity and functional status of patients with COPD. Little evidence was found for clinical benefits from IMT in patients with COPD. The authors suggested that the benefits of this training were related to the generation of adequate pressures in the mouth, considering that most studies included in the meta-analysis used a flow device for loading. Ten years later, Lotters et al.3 in a new meta-analysis that included 15 randomized controlled studies, concluded that IMT had significant effects on both the strength and endurance of respiratory muscles, thus raising the possibility of benefits from IMT in these patients. In a recent editorial, and later in correspondence between McConnell et al. and Hart et al.4 the pros and cons of the effectiveness of IMT were debated. Polkey et al.5 in a very interesting editorial, presented the scientific opinion of his research group concerning the insufficient evidence, based on the isolated use of dependent tests for assessing the function of respiratory muscles, that was used to support the possible benefits of IMT. In this editorial, the authors discussed the article of Weiner et al.6 They reported that several points are still unclear in relation to the results of IMT. Hart et al.7 recently introduced a new technique for assessing respiratory muscle endurance. These authors observed that the noticeable improvements in strength and endurance that are normally reported after IMT programmes, seem to be more related to an alteration of respiratory pattern, rather than a real increase in endurance capacity of the respiratory muscles.4 Curiously, Battaglia et al.3 after an intervention with a simple volumetric inspiratory exerciser, a device that stimulates volume without a target resistance, found an increase in maximal inspiratory pressure (MIP) of around 30% after 6 months of training. This result seems to corroborate the hypothesis that, in isolation, the dependent tests used to assess the strength of respiratory muscles (the MIP test being the most widely used) are insufficient for measuring the effects of IMT, thus supporting the results of Polkey et al.5 If a volumetric inspiratory exerciser device is used to train the respiratory muscles, it is expected that compliance of the rib cage will increase and muscle performance in the test will improve. The MIP test is a dependent test that is related to the compliance of the rib cage, and in turn to pulmonary volume. However, despite doubts in relation to IMT, Ramirez-Sarmiento et al.9 recently studied structural adaptations in the external intercostal muscle after 5 weeks of IMT in patients with COPD. This was the first, and as yet only, published study showing evidence for clinical and physiological effectiveness, and for structural adaptation of a respiratory muscle after IMT. Therefore, the following points remain obscure in relation to IMT: the techniques that should be used to assess the effects of IMT, given that the new technique proposed by Hart et al.7 is neither simple nor inexpensive to use on a daily basis in pulmonary function laboratories; the degree of improvement that should realistically be expected after IMT, given that the diaphragm of patients with COPD seems to be more active and more susceptible to fatigue than that of healthy subjects;10 and finally, can IMT be considered a valid alternative for improving functional capacity in patients with COPD?
REFERENCES


