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Title: Regional lung ventilation distribution among individuals with chronic heart failure after an inspiratory muscle training programm: A randomized controlled clinical trial

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Body: Objectives: To evaluate regional lung ventilation distribution in patients suffering from chronic heart failure (CHF) after completing inspiratory muscle training (IMT) and correlate it with functional capacity and quality of life among these individuals. Methods and Results: Nineteen CHF patients were randomly assigned to two groups: Control and IMT. Before and after muscle training, subjects were submitted to assessment protocol for respiratory muscles, digital spirometry, optoelectronic plethysmography (OEP), the six-minute walk test (6MWT) and a quality of life questionnaire (MLHFQ). There was no difference in lung function following the 12-week training period in either group. However, the IMT group showed an increase in actual and predicted MIP, higher MLFHQ score and greater distance walked in the 6MWT, as well as a reduction in the Borg scale after the 6 MWT in relation to the control. For the OEP, IMT group members exhibited higher values for total chest wall volume (Vcw), abdominal rib cage volume (Vrc,a) and abdominal volume (Vab) when compared to the control. Conclusions: For patients with CHF, IMT proved efficient in improving muscle strength, functional capacity and quality of life. The present study also analyzed the distribution behavior of lung volumes for the thoracoabdominal system in this population, showing that larger abdominal rib cage and abdomen volumes may result in more effective diaphragmatic contraction.