Abstract

Background: Reductions in quadriceps strength and peak aerobic capacity (VO2) in patients with chronic obstructive pulmonary disease (COPD) have been studied in relatively small samples over a short period. Moreover, results were not corrected for confounding variables, such as lean muscle mass, gender, and gas transfer capacity of the lungs. Objectives: To compare quadriceps muscle strength and peak VO2 in women and men while stratifying for age and gas transfer capacity. We then corrected for lower-limb lean muscle mass to see whether and to what extent the age-graded reduction remained evident. Methods: Retrospectively, data of 374 women and 593 men with COPD were analyzed: lung function, current drug therapy, quadriceps strength, peak VO2, lower-limb lean muscle mass, and gas transfer capacity. Results: Quadriceps strength and peak VO2 were lower in older women and men with a gas transfer capacity of ≤50% predicted, also after adjustment for lower-limb lean muscle mass. Moreover, quadriceps strength and peak VO2 were related to age in COPD, particularly in women and men with a gas transfer capacity of >50% predicted. Yet, counter to our hypothesis, lower-limb lean muscle mass did not show an age-graded reduction and, in turn, could not account for the relationship of age with quadriceps strength and peak VO2. Conclusions: It is apparent that there is an age-graded reduction in skeletal muscle function in patients with COPD. Therefore, prevention of an age-graded decline in quadriceps muscle strength and peak VO2 may need to become an outcome of pulmonary rehabilitation of patients with COPD.

Keywords

Chronic obstructive pulmonary disease, lower-limb lean muscle mass, peak aerobic capacity, quadriceps muscle strength, isokinetic quadriceps peak torque, aging.