CUT-OFF POINT TO IDENTIFY REDUCTION OF QUADRICEPS MUSCLE STRENGTH BASED ON THE 1-REPETITION MAXIMUM TEST (1RM) AND ITS ASSOCIATION WITH MORTALITY IN PATIENTS WITH COPD

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Resumo
Introduction: Quadriceps muscle weakness has been associated with increased mortality in individuals with chronic obstructive pulmonary disease (COPD). Pulmonary rehabilitation routinely assesses and improves quadriceps muscle strength. Nevertheless, a cut-off of quadriceps muscle weakness assessed by the 1 repetition maximum test (1RM) associated with mortality has never been established. Objective: To determine cut-off points of quadriceps muscle strength assessed by the 1RM that are associated with 4-year mortality in patients with COPD. Methods: Retrospective four-year follow-up study. Knee extensor muscle strength was assessed by the 1RM test. Cut-off points with discriminatory capacity (Receiver Operational Characteristic Curve) to identify patient’s quadriceps muscle weakness were determined to 1RM in kg and adjusted by Body Mass Index (BMI) [1RM/BMI] and weight [1RM/Weight]. Thereafter, Cox regression and Kaplan-Meier analysis were used to investigate its association with mortality. Results: 204 individuals with COPD (52% men, 66±8 years, FEV1 46[33-57]% pred) were included. Cut-off points identifying subjects with COPD with reduced quadriceps muscle strength were obtained (0.456 AUC 0.669); however, only 1RM/Weight 31% was associated with mortality (P=0.044, Univariate Cox Regression; P=0.040, Log-Rank test). Multivariate analysis showed higher mortality risk in 4-year follow-up among subjects with quadriceps weakness (Hazard ratio: 2.73 [1.14-5.46]; P=0.005), independent of sex, age and lung function. Conclusion: Quadriceps muscle weakness assessed by the 1 repetition maximum test (1RM) and adjusted by weight [1RM/Weight] presents increased 4-year mortality risk in subjects with COPD. A Cut-off point of 1RM/Weight <31% might be useful to identify quadriceps weakness which is associated with mortality.