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Title: Relationship between balance and hypoxemia, cognitive state, exercise capacity in patients with chronic obstructive pulmonary disease

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Body: Introduction and background: Current evidence suggests that individuals with chronic obstructive pulmonary disease (COPD) demonstrate reductions in balance control that may be associated with an increased fall risk. There is only few documented research to support balance assessment and training in COPD. Aims and objectives: The aim of this study was to investigate the relationship between balance and hypoxemia, cognitive state and exercise capacity in patients with COPD. Methods: Thirty-four patients with COPD (29 males, 5 females, mean FEV1=54.20±23.42%) were included in the study. Arterial blood gases were recorded. Balance and functional mobility was evaluated using a timed up and go test (TUG). Cognitive state was assessed using The Standardized Mini Mental State Examination (SMMSE). Symptom-limited maximal exercise capacity was evaluated using an incremental shuttle walk test (ISWT). Results: Forty-four percent of the patients had increased an fall risk. The TUG time was correlated with PaO2 (r=-0.40, p=0.034), SaO2 (r=-0.44, p=0.019), and SMMSE-orientation (r=-0.39, p=0.023), ISWT distance (r=-0.45, p=0.020). The PaO2 explained 30% of the variance in the TUG time (R=0.58, R²=0.30, F(1-20)=10.06, p=0.005). Conclusions: Balance and functional mobility is related with hypoxemia, cognitive state and maximal exercise capacity in patients with COPD. Further research is required to determine which factors affect the balance and to determine whether improvements in cognitive state and balance can be made with balance training or pulmonary rehabilitation in patients with COPD.