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Title: Relationship between FVC and respiratory muscle strength in patients with amyotrophic Lateral sclerosis (ALS)

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Body: Aim:The aim of this study was to analyze the relationship between Forced Vital Capacity (FVC) and respiratory muscle strength in Amyotrophic Lateral Sclerosis (ALS) patients and healthy subjects. Methods: We study 31 ALS patients and 28 healthy subjects by spirometry and respiratory muscle strength assessment (PImáx, PEmáx and SNIP). Patients were classified in relation to FVC in two grades FVC ≥ 75%pred. or FVC < 75%pred. Cut off points for respiratory muscle weakness were used for men and women: PImáx: 56.1 cmH2O/53.4 cmH2O; PEmáx: 70.6 cmH2O/57.2 cmH2O and SNIP 61.1 cmH2O/57.2 cmH2O respectively. Results: Twenty-eight ALS patients (16 males), 54 ± 12 year old and 28 healthy subjects were included in the study. We found in cross tab analysis between FVC-PImáx, FVC-PEmáx and FVC-SNIP a sensibility and specificity of 75%/58%, 81%/67% and 75%/67% respectively. We found a positive correlation between FVC%pred. /PImáx (r=0.724), FVC%pred /PEmáx (r=0.826) and FVC%pred/SNIP (r=0.748) in ALS patients (p<0.001). The relationship between PEmáx/PImáx in healthy subjects and ALS were PEmáx=16.46+1.13*PImáx and PEmáx=28.9+0.73*PImáx. A positive correlation was found between PImáx and SNIP in ALS patients (r=0.802) and health subjects (r=0.872). Furthermore, in ALS patients FVC% correlated with SNIP(r=0.748),PImáx (r=0.724) and PEmáx(r=0.826). Conclusion: In patients with ALS the combination between FVC and respiratory muscle strength can increase early detection of respiratory muscle weakness.