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Title: Exercise respiratory cycle time components in patients with emphysema

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Body: Background. We have recently demonstrated that in patients with COPD the severity of emphysema (E) measured by high resolution computed tomography (HRCT) correlated with: ratio VTpeak/FEV1; VE/VCO2 slope and PETCO2 values at peak exercise. The aim of this study was to further investigate if exercise respiratory cycle time components correlated with % of E measured by HRCT. Method. Twelve patients (age = 65 ± 8 yrs; FEV1 = 55 ± 17%pred) with moderate to severe E (quantified by lung HRCT as % voxels < –910 HU) were evaluated with incremental cardiopulmonary exercise testing (CPET). Mean inspiratory time (TiM), mean total respiratory cycle time (TtotM), mean expiratory time during exercise (TeM) and mean expiratory time during the last third of exercise (TeM-end), has been calculated. Results. Both TeM and TeM-end had a good linear correlation with % of E (r = 0,61; p = 0,004 and r = 0,63; p = 0,003).

Moreover, by dividing the patients in two groups based on the % of E (>50% and <50%), we observed that patients with higher % of E had longer TeM (TeM: 1,72 ± 0,26sec vs 1,34 ± 0,27sec, p = 0,005) and TeM-end. A good linear correlation has been observed also between TeM and PETCO2 and VE/VCO2 (r = 0,64; p = 0,002 and r = 0,7; p = 0,0005). TeM did not correlated with resting lung function values or inspiratory capacity (IC). Conclusion. The data confirm that distinct physiologic response pattern can be detected at CPET in these patients.