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Title: The relationships between hyperinflation during exercise and symptoms in adults with cystic fibrosis

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Body: Exercise tolerance is reduced in patients with Cystic Fibrosis (CF). Ventilatory limitation, peripheral skeletal muscle weakness and poor nutritional status may contribute to exercise intolerance. The mechanisms of exertional dyspnoea are less understood, but it seems that dynamic hyperinflation may play a role. So we wonted to investigate the role of exercise dynamic hyperinflation on breathlessness (DYS) and leg fatigue (LEG) in CF patients. 17 stable CF patients (32±8SD yrs; FEV_1 2.66±0.7 l; 68±16% pred; IC 3.4±1.0 l), during constant load cycle ergometry at 80% $V'O_2$ max were studied. Intensity of breathlessness and leg fatigue, by Borg scale, and IC were recorded every 2 minutes. The individual slopes of the change in IC vs DYS and IC vs LEG were also computed. Results. In most patients we did not observe a correlation between changes in IC during exercise vs either DYS (r^2 =0.30±0.28) or vs LEG (r^2 =0.35±0.26). In addition, resting IC did not predict the rate of change in DYS or LEG. Conversely, we found a close relathionship between the rate of increase in DYS per unit change in IC and the rate of increase in LEG per unit change in IC (r^2=0.85 p<0.0001). Importantly, we found a good relationship between the baseline IC and T_{LIM} (r^2=0.44 p<0.005), but not between baseline FEV1 and T_{LIM}. Conclusions. CF patients show considerable variation in the rate at which symptoms develop during exercise, suggesting that different physiological processes underline these symptoms. Baseline IC strongly predict the duration of the endurance tolerance, while the degree of resting hyperinflation is poorly predictive of exercise induced changes in DYS and LEG.