

## **The relation between hyperinflation and daily activity in COPD patients**

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### **Abstract**

**Rationale:** One of the factors causing dyspnoea in COPD patients is dynamic hyperinflation (DH), although no studies have examined the relation between the degree of DH induced by metronome-paced tachypnea (MPT) and daily physical activity measured with a 3D-accelerometer.

**Objectives:** Our main objectives were to investigate the relationships between daily physical activity (PA) and MPT-induced DH, in terms of 1) development rate and recovery rate of DH and 2) the degree of DH, in patients with COPD.

**Methods:** 35 patients with stable COPD were included. PA was assessed using a 3D-accelerometer. Subjects underwent MPT and Inspiratory Capacity (IC) manoeuvres. In the quantification of the degree of DH, the change in IC as a percentage of the total lung capacity was used to correct for body height.

**Measurements and main results:** No significant correlations were found between PA and the parameters 1) and 2) as mentioned above. Explorative analyses showed a negative correlation between static hyperinflation (SH) and PA ( $r=-0.39$ ;  $p=0.02$ ). Subgroup analyses showed that patients who did not participate in an exercise-training program had a stronger negative correlation between PA and SH ( $r=-0.53$ ;  $p=0.04$ ). No correlation was found for patients who did participate in such a program.

**Conclusion:** Although we did not find any relation between DH and PA, SH could be a useful marker to indicate reduced PA. Many patients used a decreased tidal volume and pursed-lips breathing to counteract DH. Different correlations between SH and PA were found to be present between subjects who either were or were not engaged in an exercise-training program. Therefore, this stratification should also be investigated in future studies.