

## **Hypercapnea is associated with cardiac arrhythmias in chronic obstructive pulmonary disease (COPD)**

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**Background:** Myocardial dysfunction may accompany acute exacerbations (AE) of COPD and contribute to poor outcome. One manifestation of myocardial dysfunction is cardiac arrhythmias.

**Aims and objectives:** To study determinants of self-limiting tachy-arrhythmias in COPD, and to test the hypothesis that cardiac arrhythmias are more prevalent in AECOPD, independent of COPD-severity and co-morbidity.

**Methods:** A 24h Holter-registration was collected in 74 patients with stable COPD and 45 patients with AECOPD (mean age 54y, 56% women). Any supraventricular tachycardia, frequent (>30/h) ventricular extrasystoles (VES) and any complex ventricular ectopy (bigeminy, trigeminy or non-sustained ventricular tachycardia) were registered and the associations with AECOPD and COPD-related factors (forced expiratory volume during one second, forced vital capacity, pO<sub>2</sub>, pCO<sub>2</sub>, leucocytes, high-sensitivity (hs) C-reactive protein) were analyzed. Age, gender, history of coronary heart disease, hypertension or diabetes, packyears, use of betablocker, systolic blood pressure, heart rate, body mass index, left ventricular hypertrophy and hs-troponin T were adjusted for in multivariate logistic regression analyses.

**Results:** Supraventricular arrhythmias, frequent VES or any complex ventricular ectopy were present in 35%, 18% and 32%, respectively. Hypercapnea ( $p\text{CO}_2 > 6.3\text{kPa}$ ) was independently associated with complex ventricular ectopies (odds ratio 2.7,  $p=0.022$ ). Frequent VES was more prevalent in AECOPD than COPD (27% vs 12%,  $p=0.049$ ), but not significant in the adjusted analysis.

**Conclusion:** Cardiac arrhythmias were not *per se* augmented during AECOPD. Hypercapnea may be associated with a proarrhythmic effect.