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# An electronic nose distinguishes the exhaled breath of obese patients with obstructive sleep apnoea (OSA) from subjects with a similar body mass index and without OSA

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## Abstract

**INTRODUCTION.** Airway inflammation plays an important role in Obstructive Sleep Apnoea (OSA) as well as in obesity. Numerous experimental studies have demonstrated an important role of oxidative stress and inflammation in the pathogenesis of OSA. Exhaled breath contains thousands of Volatile Organic Compounds (VOCs) in gaseous form which may be used as markers of airway inflammation and lung disease. The use of electronic nose allows a quick and real-time pattern analysis of VOCs spectrum. Recent studies have shown that an electronic nose may become a diagnostic tool for several lung diseases. It has been shown that exhaled breath of patients with OSA differed from that of controls (Greulich et al, ERJ 2013). However, it is still unclear whether this discrimination may be due to the presence of obesity rather than OSA itself. Therefore we aimed to assess the influence of obesity in the composition of exhaled VOCs.

**METHODS.** 10 obese patients with established OSA (age  $51.2 \pm 6.8$ ; BMI  $34.3 \pm 3.5$ ) and 10 obese controls without OSA (age  $56.5 \pm 7.6$ ; BMI  $33.5 \pm 4.1$ ), participated to a cross-sectional study.

Exhaled breath was collected by a previously described method (Dragonieri et al. JACI 2007) and sampled by the electronic nose (CyranoSE 320). Breathprints were analyzed by canonical discriminant analysis on principal component reduction. Cross-validation values (CVV) and Mahalanobis distance were calculated (M-dist)

**RESULTS.** Breathprints from patients with OSA were moderately separated from those without OSA (CVV=75%; M-dist =1,73).

**CONCLUSIONS.** The presence of OSA seems to alter the exhaled VOCs pattern in obese subjects.

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