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Title: Classification ability of two electronic noses in asthma and COPD

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Body: We compared the classification ability of two e-noses based on different technologies in asthma and COPD. Ten patients with severe asthma (3/7, males/females, age 67± 2.4 yrs, FEV_1 51.7 ± 7.8% pred, FVC 82.2 ± 7.6% pred, P<0.001; 9 non-smokers, 1 current smoker), 9 COPD patients (7/2, males/females, age 69 ± 3.4 yrs, FEV_1 68.9 ± 5.1% pred, FVC 82.6 ± 5.3% pred, P<0.001; ex-smokers) and 6 healthy non-smokers (4/2, males/females, age 49 ± 6.7 yrs, FEV_1 109.6 ± 3.6% pred, FVC 109.4 ± 4.4% pred) were studied in a cross-sectional pilot study. After 5 min of tidal breathing with volatile organic compound-free air, two breath samples were collected from each subject and immediately analyzed with Cyranose 320 (Smiths Detection, Pasadena, USA) and Ten 2010 (University of Rome Tor Vergata, Italy). Data were analyzed by partial least square discriminant analysis with leave-one-out cross-validation. E-noses were initially used for classifying healthy subjects and patients with pulmonary disease and, then, asthma and COPD patients. Classification capacity between patients with respiratory disease and healthy subjects was as follow: Cyranose 320, 88%; Ten 2010, 88%; e-nose combination, 92%. Classification rate between asthma and COPD patients was as follow: Cyranose 320, 92%; Ten 2010, 86%, e-nose combination, 94%. These preliminary results suggest that a combination of e-noses slightly increases classification capacity in patients with severe asthma and COPD.