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Discrimination between oral corticosteroid-treated and oral corticosteroid-non-treated severe asthma patients by an electronic nose platform

Original

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Table Of Content

240. Systemic and airway biomarkers

.....	2
2054: Discrimination between oral corticosteroid-treated and oral corticosteroid-non-treated severe asthma patients by an electronic nose platform	
.....	2



240. Systemic and airway biomarkers

2054

Discrimination between oral corticosteroid-treated and oral corticosteroid-non-treated severe asthma patients by an electronic nose platform

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Rationale: Some severe asthma patients require oral corticosteroids (OCS) likely due to greater disease severity. Exhaled molecular markers can provide phenotypic information in asthma. **Objectives:** Determine whether patients on OCS (OCS⁺) have a different breathprint compared with those who were not on OCS (OCS⁻); determine the classification accuracy of eNose as compared to FEV₁ % pred, % sputum eosinophils, and exhaled nitric oxide (FENO). **Methods:** This was a cross-sectional analysis of the U-BIOPRED cohort. Severe asthma was defined by IMI-criteria [Bel Thorax 2011]. OCS⁺ patients had daily OCS. OCS⁻ patients had never had OCS and were on maintenance inhaled fluticasone equivalent >1000 µg/day. Exhaled volatile organic compounds trapped on adsorption tubes were analysed by centralized eNose platform (Owlstone Lonestar, Cyranose 320, Comon Invent, Tor Vergata TEN) including a total of 190 sensors. t test was used for comparing groups and support vector machine with leave-one-out cross-validation as a classifier. **Results:** 33 OCS⁺ (age 55±11yr, mean±SD, 52% female, 27% smokers, pre-bronchodilator FEV₁ 64.1±24% pred) and 40 OCS⁻ severe asthma patients (age 54±15yr, mean±SD, 55% female, 35% smokers, pre-bronchodilator FEV₁ 61.8±24% pred) were studied. Sensor by sensor analysis showed that 56 sensors provided different mean values (change in sensor resistance or frequency) between groups (P<0.05). Accuracy of classification was as follows: eNose 71% (n=73), FENO 71% (n=70), FEV₁ 62% (n=73) and sputum eosinophils 59% (n=37). **Conclusions:** Preliminary results suggest OCS⁺ and OCS⁻ severe asthma patients can be distinguished by an eNose platform.