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Impact of former smoking exposure on airway eosinophilic activation and autoimmunity in patients with severe asthma

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Shareable abstract (@ERSpublications)
In patients with severe asthma, former smoking exposure is associated with airway eosinophil activation and autoimmunity towards eosinophils and macrophages, as well as an incomplete anti-inflammatory response to systemic corticosteroids. https://bit.ly/3sTBJiF

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Abstract

Introduction Severe eosinophilic asthma is characterised by frequent exacerbations and a relative insensitivity to steroids. Experimentally, smoking may induce eosinophilic airway inflammation, but the impact in patients with severe asthma is not clear.

Objective To investigate the association between smoking exposure in patients with severe asthma, and eosinophilic inflammation and activation, as well as airway autoimmunity and steroid responsiveness.

Methods Patients with severe asthma according to European Respiratory Society/American Thoracic Society criteria were assessed with sputum samples, analysed by cell differential count, and for the presence of free eosinophil granules (FEGs), autoantibodies against eosinophil peroxidase (EPX) and macrophage receptor with collagenous structure (MARCO). A subgroup of patients with eosinophilic airway inflammation was re-assessed after a 2-week course of prednisolone.

Results 132 severe asthmatics were included in the study. 39 (29.5%) patients had ⩾10 pack-years of smoking history: 36 (27.3%) were former smokers and three (2.3%) current smokers; and 93 (70.5%) had <10 pack-years exposure. Eosinophilic airway inflammation was more prevalent among patients with ⩾10 pack-years (66.7%), compared to patients with <10 pack-years (38.7%, p=0.03), as was the level of FEGs (p=0.001) and both anti-EPX and anti-MARCO (p<0.05 and p<0.0001, respectively). Omitting current smokers did not affect these associations. Furthermore, prednisolone reduced, but did not normalise, sputum eosinophils in patients with a ⩾10 pack-year smoking history.

Conclusion In patients with severe asthma, a former smoking history is associated with eosinophilic airway inflammation and activation and relative insensitivity to steroids, as well as airway autoimmunity.