

Enhanced sensory nerve reactivity in non-eosinophilic asthma

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Abstract

ABSTRACT Background: Neural mechanisms may play an important role in non-eosinophilic asthma. This study compared airway sensory nerve reactivity, using capsaicin challenge, in eosinophilic and non-eosinophilic asthma and non-asthmatics. Methods: Thirty-eight asthmatics and nineteen non-asthmatics (aged 14-21 years) underwent combined hypertonic saline challenge/sputum induction, exhaled nitric oxide (FeNO), atopy, and spirometry tests, followed by capsaicin challenge. Eosinophilic (EA) and non-eosinophilic asthma (NEA) were defined using a sputum eosinophil cut-point of 2.5%. Airway hyperreactivity (AHR) was defined as a [?]15% drop in FEV1 during saline challenge. Sensory nerve reactivity was defined as the lowest capsaicin concentration that evoked 5 (C5) coughs. Results: Non-eosinophilic asthmatics (n=20) had heightened capsaicin sensitivity (lower C5) compared to non-asthmatics (n=19) (geometric mean C5: 58.3µM, 95% confidence interval 24.1-141.5 vs 193.6µM, 82.2-456.0; p<0.05). There was a similar (but non-significant) difference in capsaicin sensitivity in NEA compared with EA (n=18), (58.3µM, 24.1-141.5 vs 191.0µM, 70.9-514.0; p=0.07). FEV1 was significantly reduced from baseline following capsaicin inhalation in both asthmatics and non-asthmatics but no differences were found between subgroups. No associations with capsaicin sensitivity and atopy, sputum eosinophils, blood eosinophils, asthma control, or treatment were observed. Conclusion: Non-eosinophilic asthma, but not eosinophilic asthma, showed enhanced capsaicin sensitivity compared with non-asthmatics. Sensory nerve reactivity may therefore play an important role in the pathophysiology of non-eosinophilic asthma.

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