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Interrelationships between body mass index, total IgE, and blood eosinophils count in healthy subjects

Aim: To assess the influence of total IgE on the association between body mass index (BMI), smoking status and blood eosinophil (B-Eos) count in healthy subjects from a large population-based sample.

Methods: We analysed data on 4,785 children/adolescents (<18 years) and 5,563 adults (18-79 years) from the 2005-2006 US National Health and Nutrition Examination Survey. Subjects without any reported respiratory disease, hay fever and/or non-respiratory diseases significantly associated with B-Eos count (heart diseases, stroke, and metabolic syndrome; Amaral, R. et al. Clin Transl Allergy 2021; 11: e12036), were considered healthy. Two multivariate regression models were developed with B-Eos count as outcome variable: model 1 included age, sex, race/ethnicity, BMI categories, and smoking status (in adults only); and model 2 also included total IgE.

Results: A total of 3,541 healthy children/adolescents and 1,465 adults were included. In model 1, B-Eos count was significantly associated with overweight/obesity in children/adolescents and adults ($p=0.041$ and $p=0.039$, respectively) as well as with current smoking ($p=0.041$). In model 2, B-Eos count was significantly associated with total IgE in both age groups ($p<0.001$), and current smoking remained significant ($p=0.020$). However, BMI was no longer associated with B-Eos count ($p>0.05$ both groups).

Conclusion: This study showed an independent relationship between B-Eos count and total IgE in healthy subjects. When adjusted for total IgE, the association between B-Eos count and BMI disappeared whereas the

association with current smoking remained, indicating different mechanisms underlying increased B-Eos count upon these exposures.