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Title: Magnitude of the late allergen response in seasonal vs perennial allergen bronchoprovocation

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Body: Background: Allergen bronchoprovocation test (BPT) is a validated model to study asthma pathophysiology and response to treatments. The magnitude of the allergen-induced late asthmatic response (LAR) varies between individuals, possibly due to differences in immune responses, but also to the type of allergen to which the individual is sensitized. Aim: To determine the relationship between the magnitude of the LAR in mild asthmatic subjects according to the type of allergen inhaled. Methods: This is a retrospective analysis of allergen BPT data gathered between 2003 and 2010. Baseline induced sputum differential and the decrease in FEV1 at the early asthmatic response (EAR) and LAR after BPT were analyzed. Only data from subjects with a dual EAR and LAR were included. EAR was defined as a $\geq 20\%$ fall in FEV1 between 0h and 3h and LAR as a $\geq 15\%$ fall in FEV1 between 3h and 7h post BPT. The magnitude of the allergen response was defined as the ratio of EAR over LAR (EAR% fall in FEV1/LAR % fall in FEV1). Results: Data from 336 subjects (218F/118M, mean age \pm SD; 29 \pm 11 y) were analyzed: 279 were challenged with perennial allergens (HDM, cat, dog) and 57 with seasonal allergens (grass, ragweed, tree pollen). There was a significant difference between the magnitude of the responses to perennial allergens vs seasonal allergens (mean; 1.46 vs 1.69, p=0.007). There was no correlation between the magnitude of the LAR and baseline sputum eosinophil percentage in either group or in the whole sample. Conclusion: Perennial allergens induce a significantly more marked LAR for a given EAR. This may be due to a "priming" effect of persistent exposure to these allergens or to non-IgE-mediated mechanisms.