Early administration of a handful of birch pollen allergen, Bet v 1-derived peptides induces tolerance against Bet v 1 and cross-reactive PR10 allergens

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Abstract text

Text: Bet v 1 is the major allergen of birch pollen. Bet v 1-allergic patients often react to Bet v 1-cross-reactive allergens in pollen from related trees and to fruits and vegetables containing Bet v 1-cross-reactive pathogenesis-related (PR) proteins.

This study investigates if early postnatal administration of Bet v 1-derived peptides induces immunological tolerance against sensitization to Bet v 1 and cross-reactive PR10 allergens.

Bet v 1 and several other PR10 allergens from alder pollen (Aln g 1) **,** hazelnut pollen (Cor a 1.01), apple (Mal d 1), hazelnut (Cor a 1.04), carrot (Dau c 1), soy (Gly m 4), peanut (Ara h 8), peach (Pru p 1) were expressed in *E. coli* and purified by Ni-NTA agarose affinity chromatography. Seven Bet v 1-derived peptides were synthesized using Fmoc solid-phase peptide synthesis. Three-week-old BALB/c mice received intraperitoneal injections of the peptide mixture or PBS. Mice were sensitized with alum-adsorbed recombinant Bet v 1 and the unrelated grass pollen allergen Phl p 5, or PBS only. A microarray chip incorporating the aforementioned recombinant PR10 allergens and peptides derived from Bet v 1, Mal d 1 and Ara h 8 was developed to evaluate specific IgE, IgG1 and IgG2a antibody responses. Allergic sensitization was assessed by basophil degranulation.

Preventive administration of Bet v 1 peptides almost completely abolished the development of IgE and IgG antibody responses to Bet v 1 and related PR10 allergens, and PR10 allergen-induced basophil degranulation, but had no effect on allergic responses to the unrelated allergen Phl p 5.

Results suggest that preventive administration of Bet v 1-derived peptides may be a promising approach to induce tolerance against allergic sensitization to Bet v 1 and cross-reactive PR10 allergens which should be further developed in preclinical and clinical studies.

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Conflict of Interest statement

Do you have any conflict of interest to declare?: No

Affirmation

1. Consent to participate and present onsite: Yes
2. Consent to publication publication: Yes
3. Consent on treatment of contact details saved in this system: Yes