Sequential IgE epitope analysis of a birch pollen allergen (Bet v1) and an apple allergen (Mal d1)

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Cross-reactivity in IgE epitopes and T cell epitopes has been reported between major birch pollen allergen (Bet v1) and major apple allergen (Mal d1). To treat people with birch pollinosis complicated by apple hypersensitivity by peptide immunotherapy, a sequential IgE epitope analysis was performed to study IgE epitopes that recognize birch pollen and apple allergens at the level of peptides. Subjects in the present study were three patients who exhibited clinical symptoms indicative of birch pollinosis during the pollen season. Two of the three patients had apple hypersensitivity and the capsulated hydrophobic carrier polymer (CAP)- radioallergosorbent test (RAST) class for apple was at least 2. The IgE epitope assay was performed by peptideCNBr gel binding assay. In two of the three patients, IgE bound strongly to Bet vI 51-70 peptide and also to 11-30, 21-40, 11-120, 111-130 and 141-159 peptides. In the other patient, IgE bound to 11-30, 61-80, 111-130 and 141-159 peptides in a comparable manner. The IgE epitopes of Bet v1 and Mal d1 were found in similar locations. The results of sequential IgE epitope analyses on Bet v1 and Mal d1 revealed epitopes near the proximal regions of these allergens. Thus, the three-dimensional structure of Mal d1 is likely similar to that of Bet v1, which suggests that peptide immunotherapy designed for birch pollen is more than likely to be effective against apple allergy.

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