

Pollen-food syndrome is related to Bet v 1/PR-10 protein sensitisation, but not all patients have spring rhinitis

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The pollen-food syndrome (PFS) results from sensitisation to panallergens that are common to pollen and edible plant products, typically manifesting as oral symptoms upon exposure to Rosaceae fruits. The pan-allergen molecules comprise three protein clusters: Bet v 1/PR-10; profilins;

non-specific lipid transfer proteins (nsLTP) (1). The sensitisation profile of PFS patients to these proteins varies geographically in Europe, with PR-10 proteins the dominant allergen in Northern Europe and nsLTP in the South (2). Anecdotally, PFS in the United Kingdom is related to birch pollinosis and sensitisation to the Bet v 1/PR-10 cluster, but published data are lacking. Accordingly, we studied the clinical phenotype and sensitisation profile of 24 PFS patients presenting to a UK allergy clinic. The study protocol was approved by the NHS Research Ethics Service and all patients provided informed written consent. Food allergies were assessed by a standardised physician-administered questionnaire, which included 38 relevant plant-derived foods. Donor serum was analysed for IgE directed against allergen components by a solid-phase microarray assay (VBC Genomics, Vienna, Austria).

The group were highly atopic, with 100% sensitised to birch pollen, 88% to grass pollens, 63% to cat dander and 50% to house dust mite; 96% reported rhinitis, 32% asthma and 6% eczema. Foods reported to cause oro-pharyngeal symptoms are displayed in order of fre-

quency in Fig. 1. Component-resolved diagnosis demonstrated ubiquitous sensitisation to the Bet v 1/PR-10 protein cluster, with 71% of patients monosensitised to PR-10 proteins and negative for nsLTP and profilin. Despite this finding, four of 24 had no history (past or present) of spring rhinitis: of these, two had symptoms restricted to the summer months only, one had chronic rhinitis with house dust mite allergy and one had no history of rhinitis. Four of 24 donors were co-sensitised to the profilin protein cluster, 3 of 24 co-sensitised to nsLTP, but none to all three proteins. All profilin-sensitised donors were allergic to grass pollen and clinical reactions to citrus, banana and papaya were restricted to this group, consistent with previous observations (3). Patients with co-sensitisation to the profilin protein cluster reported reactions to significantly more food items than those sensitised to PR-10 proteins alone or with nsLTP (mean 13.8 foods vs 6.2 respectively, $P = 0.004$ by Student's *t*-test). The clinical relevance of co-sensitisation to nsLTP in three patients of this small cohort is unclear as none described systemic reactions to peaches or any other food.

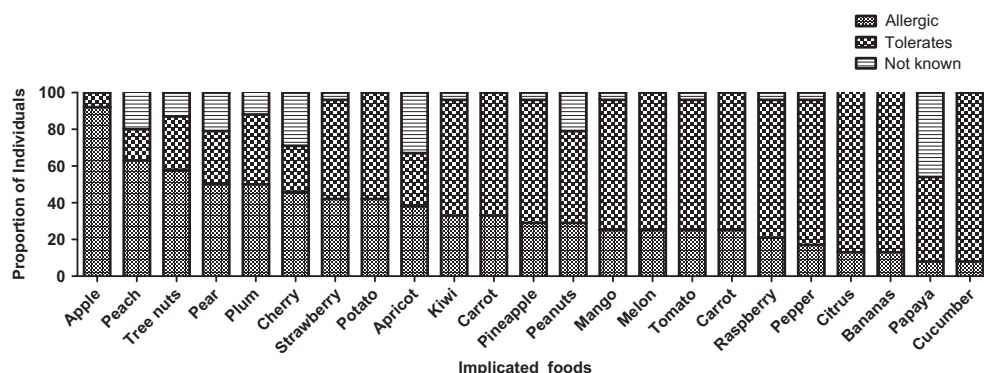


Figure 1 Foods reported to cause symptoms in 24 patients with pollen-food syndrome.

Eight of 24 patients reported more severe symptoms associated with ingestion of plant-derived foods. Seven patients described difficulty in breathing following ingestion of cooked and uncooked nuts (four with peanuts and three with various tree nuts). One patient reported similar symptoms after eating raw carrots. A variety of plant-derived foods were reported to reproducibly cause diarrhoea soon after exposure in 4 of 24 patients, including apple, pear, banana, melon, tomato. Finally, facial angioedema was reported within 30 min of eating raw peach in one patient and raw apple in another. Aside from positive results for PR-10 proteins, none of these patients were sensitised to nsLTP or type 1 allergens. These symptoms were self-limiting in all cases and were not a universal indication for prescription of epinephrine autoinjector devices.

To summarise, PFS was closely associated with sensitisation to the PR-10 protein cluster in this small UK cohort. Not all patients have spring rhinitis, highlighting the importance of investigation for panallergen sensitisation regardless of rhinitis history in patients with appropriate symptoms. Profilin sensitisation was a clinically relevant co-factor in some patients, but sensitisation to nsLTP was of uncertain clinical significance. Recent publications have high-

lighted a possible role for nsLTP outside of the Mediterranean in the context of peach allergy (4) and hazelnut allergy (5) and larger studies of UK patients will be required to explore this further.

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Author contribution

Dr Rashid was responsible for patient recruitment, data analysis and produced the first draft of the manuscript. Miss Smith analysed serum samples by microarrayed component-resolved diagnosis and reviewed the manuscript. Dr Nambiar assisted with optimisation of the microarray scanner, data acquisition and reviewed the manuscript. Professor Frew assisted with patient recruitment and reviewed the manuscript. Dr Tarzi devised the pilot study, assisted with

patient recruitment and revised the 1st draft of the manuscript.

Conflict of interest

Professor Frew is an associate editor of the journal. The other authors have no conflicts of interest to declare.

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