DECISIONS

Oral allergy syndrome

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A 25-year-old man presents with itchiness in his mouth immediately after eating fruits such as apples, peaches and cherries. On a few occasions after eating peanuts and almonds, he also has felt tightness in his throat and a sensation that his throat was closing. He has a history of seasonal allergies (rhinorrhea and sneezing) in the early spring.

Does this patient have food allergies?

It appears that this patient is presenting with an allergy to fruits and nuts. However, he does not have a true food allergy; rather, he has pollen–food or oral allergy syndrome. His symptoms result from seasonal rhinorrhea (intermittent allergic rhinitis), an allergic reaction presenting with local IgE-mediated mast-cell activation causing rapid-onset tingling and pruritus of the lips, mouth and oropharynx.^{1,2} These symptoms, although usually short-lived and benign, can occasionally cause more severe allergic reactions if they are accompanied with pharyngeal swelling.

Most adult-onset food allergies are the result of cross-reactions between foods and inhaled allergens.³ Cross-reactivity is caused by IgE antibodies that can bind to pollen proteins and structurally similar food allergens (i.e., a pan-allergen). Therefore, cross-reactive epitopes can cause two clinical scenarios: hay fever triggered by pollens and associated food allergies.²

Table 1 summarizes common cross-reactive foods and their pollen analogues.^{1–6} Fruits associated with oral allergy syndrome are in the apple and plum families, but patients may also react to potatoes, carrots, celery, peanuts, hazelnuts and almonds. For example, the cross-reactivity between birch pollen and various foods is a consequence of a homology of various pathogen-related proteins. Mal d 1, the major apple allergen, is 63% homologous to Bet v 1, the major birch pollen allergen. Other birch pollen-related proteins have been identified in hazelnuts (Cor a 1), celery (Api g 1) and potatoes.^{5,6}

Seasonal rhinorrhea in the early spring is most likely caused by allergies to tree pollens. Oral allergy syndrome occurs in 50%–70% of patients who are specifically sensitized to birch pollen.^{7,8} Given our patient's history of seasonal allergies in the early spring and the symptoms he has after eating some foods, it is likely that he has oral allergy syndrome.

Are further investigations required?

A diagnosis of oral allergy syndrome is based primarily on clinical history, but it should be confirmed by skin prick testing.¹ In patients with allergies to airborne particles, itching or tingling in the mouth after eating fresh fruit or vegetables is enough to suspect oral allergy syndrome. Diagnosis can be delayed because the reaction to such foods will be inconsistent if the cross-reactive proteins have already been denatured, as in cooked, canned, pasteurized and frozen foods. Nut allergens, however, are generally not destroyed by these processes. Seasonal rhinorrhea may be overshadowed by reactions to raw fruit and nuts.

The commercially available fruit extracts used in allergy testing are not usually reliable indicators of allergy in patients with oral allergy syndrome, because the cross-reactive epitopes have been destroyed by the manufacturing process.¹ Prick-plus-prick testing (prick the fruit, then prick the skin) with freshly prepared fruit extracts is more sensitive in detecting allergen-specific IgE-antibody. In vitro IgE blood tests are available, but their sensitivity and specificity in patients with oral allergy syndrome require further confirmatory studies.^{2,4,5} Component-specific diagnostic skin test reagents are not yet available.

What treatment should be offered?

The easiest and safest way to treat oral allergy syndrome is to recommend that the patient avoid the foods that cause the problem. Cross reactivity varies among patients. Only those foods causing the clinical allergy need to be avoided.

Oral allergy syndrome should be managed according to the clinical presentation. It is often more prominent during the specific season for airborne pollen that corresponds to the seasonal rise in related IgE antibodies. Most patients with seasonal allergic rhinitis can be treated with a combination of allergen avoidance and pharmacotherapy.⁹ Immunotherapy may be beneficial if a single allergen is implicated.⁸ Pollen-specific immunotherapy can be used to treat rhinosinusitis, conjunctivitis and asthma resulting from exposure to birch or tree pollen.^{8,10}

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Table 1: Types of pollen and food associated with oral allergy syndrome¹⁻⁶

Pollen	Fruit	Vegetables/spices	Nuts/seeds/legumes
Alder	Apples, cherries, peaches, pears	Parsley, celery	Almonds, hazelnuts
Birch	Kiwi, apples, pears, plums, peaches, nectarines, apricots, cherries, tomatoes	Celery, carrots, potatoes, parsnips, green peppers, dill, cumin, peas, cilantro, fennel	Hazelnuts, walnuts, almonds, peanuts, lentils, beans
Grass	Melon, watermelon, oranges, tomatoes	Potatoes	Peanuts
Mugwort*		Celery, carrots, dill, parsley, fennel, coriander, cumin	Sunflower seeds
Ragweed	Watermelon, cantaloupe, honeydew, bananas	Zucchini, cucumbers, squash	

*Also associated with honey.

In our patient, treatment with tree-pollen-specific immunotherapy for hay fever may decrease the associated food allergies. Patients have anecdotally indicated a decreased severity of symptoms related to oral allergy syndrome after immunotherapy or during seasons with lower pollen counts. However, a review of studies on the effect of pollen-specific immunotherapy on oral allergy syndrome has shown variable outcomes.¹¹ In addition, if patients outgrow their inhalant allergies, there may be a higher threshold or disappearance of reactions to the foods that cause oral allergy syndrome.

Our patient has symptoms caused by an allergy to raw apples, peaches and cherries. He should avoid these fruits; however, he may be able to eat them if they are cooked. A self-injected epinephrine device is not generally needed for oral allergy syndrome. However, because our patient presented with a feeling of tightness in his throat, such a device was prescribed.

For more information on the diagnosis and management of intermittent allergic rhinitis, see *CMAJ* 2010;182:935-7.⁹

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