Oral Allergy Syndrome

Description/Etiology
Oral allergy syndrome (OAS), sometimes referred to as pollen-food allergy syndrome, is a mild type of food allergy triggered by eating certain raw fruits, vegetables, nuts, seeds, herbs, and sometimes spices that are related to tree, grass, or other plant pollens which cause seasonal allergy symptoms. The symptoms of OAS are limited to the oral cavity and generally are mild and short lived. The main symptom is itching or a burning sensation in the mouth and/or throat. Although rare, it is possible that OAS may cause severe throat swelling which may make breathing or swallowing difficult, leading to anaphylaxis.

OAS is an immunoglobulin E (IgE) allergic reaction. Susceptible individuals are allergic to the proteins of pollen (e.g., birch, grass, ragweed) which often cause allergic rhinitis, commonly referred to as hay fever. In these individuals, the immune system produces IgE antibodies against the proteins of the allergen. Many fruits and vegetables contain structurally similar proteins to offending pollens and are termed “panallergens.” Even though they are not botanically related to the offending pollen, these panallergens confuse the immune system and cause an allergic reaction, referred to as cross-reactivity.

Pollen types and foods associated with OAS include the following:

› Birch pollen
  • Kiwi, apple, pear, plum, peach, nectarine, apricot, cherry, banana, fig, avocado, strawberry, dried plum, mango
  • Celery, carrot, parsnip, parsley, dill, cumin, cilantro, fennel, potato, tomato, green pepper, chicory
  • Hazelnut, almond, walnut, peanut
  • Soybeans, wheat, lentils, peas, beans

› Ragweed pollen
  • Banana, watermelon, melon (e.g., honeydew, cantaloupe)
  • Squash, pepper, cucumber, artichoke, hibiscus, zucchini, chamomile tea, Echinacea
  • Sunflower seeds

› Wormwood pollen
  • Apple, watermelon, other melons
  • Celery, carrot, parsley, pepper, cilantro, fennel

› Grass pollen
  • Fig, melon, orange, kiwi, watermelon
  • Tomato, potato
  • Peanut

› Alder pollen
  • Apple, cherry, peach, pear, strawberry, raspberry
  • Celery, parsley
  • Hazelnut, almond, walnut

› Mugwort pollen
  • Mango
  • Celery, carrot

› Plane tree pollen
  • Apple
  • Lettuce, corn
- Hazelnut, peanut
- Chickpea

OAS is caused by activation of local mast cells, and unlike other food allergies which can cause a systemic reaction OAS generally is confined to the oropharynx. Symptoms include oral pruritus, tingling, and swelling of the lips, tongue, palate, and throat (see Signs and Symptoms/Clinical Presentation, below). Symptoms generally come on within minutes of eating or, for the most sensitive individuals, of handling or inhaling the offending fruit, vegetable, spice, herb, nut, or seed. Individuals may have different reactions based on different allergens or even different varieties of fruits or vegetables.

According to the American Academy of Allergy, Asthma & Immunology (AAAAI), there is no definitive test for OAS, but affected individuals may have a positive allergy skin-prick test or a blood test for a specific pollen. In most patients OAS is diagnosed based primarily on clinical history.

**Facts and Figures**

- OAS is more common in adults and it affects more females than males. The most frequent conditions associated with OAS are asthma and allergic rhinitis. It rarely is diagnosed in young children, but the incidence increases with age and co-occurring conditions. In a study on the prevalence of OAS in a pediatric population in Sydney, researchers estimated that 4.9% of the 163 patients between the ages of 7 and 15 years were affected.
- A history of allergic rhinitis increases the risk of OAS. In a study evaluating the presence of OAS in 120 pediatric patients with allergic rhinitis, researchers found 29.7% to have the condition (Rodríguez-Mireles et al., 2013; Brown & Katerlaris, 2014; Ivkovic-Jureković, 2015).
- OAS is thought to be the most common form of food allergy in adults. The AAAAI estimates that up to 50-75% of adults allergic to birch tree pollen have OAS.
- Many of the food allergens that induce OAS are easily denatured by gastric acid and by heat, as in cooking.
- Allergens in strawberries and celery will not be destroyed with heat.
- Nuts may contain multiple allergens, some of which may be destroyed by heat treatment and some of which may not.

**Risk Factors**

- More than half of those affected by OAS have asthma or allergic rhinitis.
- OAS affects more women than men.
- Although OAS can occur at any time of the year, symptoms might be worse during hay fever season.

**Signs and Symptoms/Clinical Presentation**

Symptoms typically include rapid-onset itching and/or burning of the lips, mouth, throat, or ears. More severe reactions may include vomiting, diarrhea, indigestion, and throat tightness with difficulty breathing.

Signs may include swelling of the lips, tongue, palate, throat, or uvula.

**Nutritional Assessment**

- **Patient Medical History**
  - Review patient’s medical chart, if available, or ask about any personal or family history of seasonal, pollen, or food allergies, and any history of oropharyngeal-related symptoms which occur immediately after eating fresh fruits, vegetables, spices/herbs, seeds, nuts, or legumes.

- **Patient Dietary History**
  - Conduct a food frequency and a 3-day diet history that includes one weekend day to assess for intake of any fruits, vegetables, herbs/spices, seeds, nuts, or legumes that are known sources of OAS, or any other foods which elicit OAS symptoms.
  - Ask about meals consumed at home, or eaten away from home.
  - Ask patient about any fruit, vegetable, nut, seed, or legume-based beverages consumed.
  - Ask patient about any herbal supplements or over-the-counter supplements which might contain OAS-related ingredients.

- **Patient Anthropometrics**
  - Patient’s height and weight should be measured as part of the assessment; however, no research is available to suggest that weight, height, or body mass index is relevant to the diagnosis of or medical nutrition therapy for OAS.

- **Laboratory and Diagnostic Tests of Particular Interest to the Nutritionist**
  - Serum specific IgE and/or skin prick will be abnormal, and testing, along with symptoms, can confirm diagnosis.
Treatment Goals

› Reduce the Risk of Symptoms and Complications
  • Educate the patient/family about OAS, including risk factors, allergenic foods, typical onset of symptoms, and ways to minimize reactions, including
    – avoiding ingesting or touching raw offending foods and related foods
    – cooking offending and related foods prior to eating
    – rinsing the mouth with water after consuming allergenic foods
    – taking an antihistamine if recommended after consuming allergenic foods, or if symptoms appear

› Maintain Optimum Nutritional Status
  • Review any nutrients of concern that may be reduced by eliminating foods which cause OAS
  • Provide recommendations for appropriate substitutes to maintain nutritional status
  • Encourage multivitamins or other appropriate supplements as appropriate to prevent nutritional deficiencies

› Provide Emotional Support and Educate
  • Assess the coping ability of the patient, and for any knowledge deficits and anxiety regarding OAS
  • Educate patients about the risk of any potentially rare but serious side effects and encourage them to ask their treating clinician about the use of antihistamines, an epinephrine autoinjector, etc. to manage their symptoms, and any individualized prognosis

Food for Thought

› Latex-fruit syndrome is a condition in which latex allergens can sensitize patients to cross-react to proteins found in some foods. Cross-reactive foods may include banana, avocado, kiwi, chestnut, potato, papaya, and eggplant (Kashyap & Kashyap, 2015; Bansal, 2013)

› Although most cases of OAS are mild and resolve quickly, more severe systemic reactions have been noted. Ando et al. (2011) reported a case of a 69-year-old woman who suffered from a severe systemic reaction shortly after consuming pistachios which included oropharyngeal irritation, facial angioedema, abdominal pain, diarrhea, vomiting, and breathing difficulty. The authors note that very few allergies to pistachio, including OAS, have been recorded

› Immunotherapy may be beneficial in managing OAS if a single allergen is implicated, but further research is needed. The best treatment for OAS is to avoid the implicated food

Red Flags

› Patients with poorly controlled asthma are at increased risk for more serious or fatal reactions

› Patients should be educated about the potential for latex-fruit syndrome (see Food for Thought, above)

› Patients should be advised to contact their treating clinician if symptoms are getting progressively worse or are caused by cooked fruits and vegetables or nuts, and to call 911 if OAS symptoms are causing significant throat swelling or discomfort or they develop a systemic reaction

What Do I Need to Tell the Patient/Patient’s Family?

› Reinforce any treatment plan from the treating clinician and stress that the best way to avoid OAS is to avoid the raw food(s) to which the patient is allergic. The food is more likely to be tolerated when cooked

› Advise the patient to report any new or worsening symptoms to the treating clinician

› Stress the need for patients with a history of anaphylactic reactions to carry an epinephrine autoinjector and to know how to use it

Related Guidelines

American Academy of Allergy, Asthma & Immunology. Oral Allergy Syndrome (OAS)

References


