

Oral Allergy Syndrome (Pollen–Food Allergy Syndrome)

Tejashri S. Purohit-Sheth, M.D., and Warner W. Carr, M.D.

ABSTRACT

A case of Oral Allergy syndrome or Pollen–Food Allergy Syndrome is briefly discussed. The clinical characteristics, diagnosis, pathogenesis, and management of this syndrome are discussed followed by clinical pearls and pitfalls for the practicing allergist. Symptoms generally occur with the ingestion of raw fruits/vegetables and nuts; cooked foods are not a problem. Symptoms are caused by a heat-labile protein in fruits, vegetables, and nuts that cross-reacts with proteins in aeroallergens. Cross-reactive proteins share homologous epitopes, and several groups with similar homologous proteins have been identified; many of these groups are referred to as pathogenesis-related proteins. (Allergy and Asthma Proc 26:229–230, 2005)

QUESTION

A 22-year-old patient presents to the clinic for evaluation of his “allergies.” He describes a 10-year history of worsening nasal congestion, rhinorrhea, and nasal pruritus in the spring, and seeks to identify his allergic triggers. He also notes that he is allergic to several foods: apples, pears, potatoes, carrots, and celery. With further questioning regarding his food allergies, it is learned that his symptoms are limited to itching of his tongue, cheeks, soft palate, and lips upon ingestion of these foods. Symptoms occur within 15 minutes and resolve within an hour. He notes that symp-

toms occur only when these foods are eaten in the raw state, not when they are cooked or canned. Which of the following statements is correct?

- A. This patient has severe food allergies, with a significant probability of having a generalized systemic anaphylactic reaction if he continues to eat these foods.
- B. Skin testing to aeroallergens will most likely reveal an allergy to ragweed.
- C. Up to 70% of patients that are allergic to birch pollen will have similar symptoms as this individual after ingestion of fresh fruits or vegetables.
- D. Aeroallergen immunotherapy has consistently proven ineffective in ameliorating the oral itching described in this patient.
- E. These symptoms are most likely related to specific IgE to heat-stable food proteins.

INTRODUCTION

Oral Allergy Syndrome (OAS), or recently coined Pollen–Food Allergy Syndrome referred to by some, is a common adverse reaction to the ingestion of certain raw fruits, vegetables, and nuts, that cross-react with aeroallergens¹. It is estimated that up to 25–50% of individuals with pollen allergy have associated OAS² and up to 70% of birch allergic patients have associated OAS.^{1,3}

CLINICAL CHARACTERISTICS

The predominant symptoms of OAS are oropharyngeal pruritus and tingling, which can be associated with oral and perioral angioedema.⁴ Typically, the oropharyngeal pruritus and tingling occur wherever the triggering food contacts the oropharyngeal mucosa—the lips, tongue, gums, buccal mucosa, palate, and pharynx. Rarely is this associated with life-threatening pharyngeal edema or systemic allergic reactions.⁴ The progression of initial oropharyngeal contact

From the Walter Reed Army Medical Center, Washington, D.C. The views and opinions expressed in this submission represent the opinions of the author and in no way represent the views of the Food and Drug Administration or the United States Government. Address correspondence and reprint requests to Tejashri S. Purohit-Sheth, MD, 3911 Arbor Crest Way, Rockville, MD, 20853. Copyright © 2005, OceanSide Publications, Inc., U.S.A.

reactions to systemic reactions, including anaphylaxis, is estimated to be 1–2%.⁵ Symptoms usually occur within minutes of ingestion of raw fruits and vegetables, are generally short-lived, and typically do not occur if the fruits or vegetables are cooked or canned.

DIAGNOSIS

The diagnosis is made by the history, *i.e.*, typical oropharyngeal pruritus and tingling noted with the ingestion of fresh fruits and vegetables in a patient with seasonal allergic rhinitis. The history can be confirmed with a “prick and prick” test, where the lancet first pricks the suspect fresh fruit or vegetable, followed by pricking the patient’s skin. This test method is easily performed and reproducible.⁴ In most patients, the diagnosis is based on the classic history, and strengthened by the presence of positive skin tests to cross-reactive aeroallergens.

PATHOGENESIS

The symptoms and time course are characteristic of a Type-I IgE-mediated reaction. Symptoms occur secondary to the presence of IgE directed at specific heat-labile proteins in fresh fruits and vegetables that cross-react with aeroallergens. Several classes of plant proteins with homologous epitopes have been identified. These proteins are widely found in different plants, and their genes are highly conserved because of their importance in plant defense functions.⁴ These proteins have been termed “pathogenesis-related proteins” or PR. The PR-3 and PR-4 families consist of chitinases and are common to avocados, chestnut, and banana. PR-10 contains bet v 1 (the predominant allergen in birch), apple, cherry, apricot, celery, carrot, and potato. PR-14 contains lipid transfer proteins (LTP), noted in peach and apple. Profilins are another class of homologous proteins containing Birch bet v 2, which cross-reacts with apples, carrots, cherries, pears, and potatoes.

Typically, birch-allergic patients will have OAS triggered by the raw ingestion of apples, pears, carrots, celery, potatoes, hazelnuts, and kiwi. Ragweed-allergic patients usually have problems with watermelon, cantaloupe, honeydew, and bananas. Mugwort-allergic patients may manifest symptoms to apples, carrots, celery, coriander, fennel, and melons, and grass-allergic patients tend to react to melons, oranges, and tomatoes.⁴

MANAGEMENT

The best management option is avoidance of the triggering food in the raw form, because the cooked food rarely, if ever, causes symptoms. Immunotherapy to the cross-reacting aeroallergen has been shown to be beneficial in ameliorating symptoms of both allergic rhinitis and OAS in some patients.^{2,5–8} Although the likelihood of anaphylaxis is low, prescribing an Epipen to all patients with OAS has been advocated.⁴

Answer: C

PEARLS

- Oral allergy syndrome or Pollen–Food Allergy Syndrome is characterized by oropharyngeal pruritus and tingling after ingestion of raw fruits and vegetables in patients with seasonal allergic rhinitis.
- Symptoms are caused by a heat-labile protein in fruits, vegetables, and nuts that cross-reacts with proteins in aeroallergens.
- Birch-allergic patients will typically react to apples, pears, carrots, celery, potatoes, hazelnuts, and kiwi.
- Ragweed-allergic patients usually have problems with watermelon, cantaloupe, honeydew, and bananas.
- Mugwort-allergic patients may manifest symptoms to apples, carrots, celery, coriander, fennel, and melons.
- Grass-allergic patients tend to react to melons, oranges, and tomatoes.
- Avoidance of triggering fruits, vegetables, and nuts is the best management option. Immunotherapy to the cross-aeroallergen may be beneficial for treatment of OAS symptoms.

PITFALLS

- A small percentage of patients with OAS may develop systemic reactions, which are considered to be true food-induced anaphylactic reactions.
- Patients can experience angioedema of the pharynx with OAS. Therefore, strict avoidance of OAS-triggering foods is recommended.
- Prescribing an Epipen is recommended.

REFERENCES

1. Ma S, Sicherer SH, and Nowak-Wegrzyn, A. A survey on the management of pollen–food allergy syndrome in allergy practices. *J Allergy Clin Immunol* 112:784–788, 2003.
2. Sampson HA. Adverse reactions to foods. In Middleton’s *Allergy, Principles and Practice*, 6th ed., Adkinson, MF, Yunginger JW, Busse WW, et al. (eds.). Philadelphia: Mosby, Inc., 1619–1643, 2003.
3. Sicherer SH, and Teuber, S. Current approach to the diagnosis and management of adverse reactions to foods. *J Allergy Clin Immunol* 114:1146–1150, 2004.
4. Sloane D, and Sheffer A. Oral allergy syndrome. *Allergy Asthma Proc* 22:321–325, 2001.
5. Food Allergy: A Practice Parameter, Draft 10/1/04, obtainable from JCAAI; Summary Statement 21: p. 43.
6. Kelso JM, Jones RT, Tellez R, and Yunginger JW. Oral allergy syndrome successfully treated with pollen immunotherapy. *Ann Allergy Asthma Immunol* 74:391–396, 1995.
7. Bolhaar STHP, Tiemessen MM, Zuidmeer L, et al. Efficacy of birch-pollen immunotherapy on cross-reactive food allergy confirmed by skin tests and double-blind food challenges. *Clin Exp Allergy* 34:761–69, 2004.
8. Asero, R. How long does the effect of birch pollen injection SIT on apple allergy last? *Allergy* 58:435–438, 2003. □

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.