



Food-induced Allergic Rhinitis

Mohammad Hasan Bermanian^{1*}

Saba Arshi²

Mohammad Nabavi³

^{1,2,3}Department of Immunology and Allergy, Faculty of Medicine, Tehran University of Medical Sciences, Tehran, Iran

ARTICLE INFO

Article type:

Review Article

Article history:

Received: 10Aug 2012

Revised: 27Dec 2012

Accepted: 9Jan 2013

Keywords:

Food allergy, Allergic rhinitis,
Children

<http://jpr.mazums.ac.ir>

ABSTRACT

Food allergy is estimated about 8% in children. The relationship between food and manifestation of allergy symptoms and its confirmation for accurate diagnosis is very important. Allergic rhinitis is a common disease with a prevalence of 40% among different societies. The prevalence of food-induced allergic rhinitis appears to be less than 1 percent. Food reactions often lead to rhinitis symptoms at a no immunologic nature. Although the role of food and fruits in developing allergic rhinitis is not clearly identified, in a very small percentage of patients, rhinitis is the clinical manifestation of food allergy.

Introduction

The role of nutrition in different diseases, such as allergy especially food-induced allergy is well established. Food allergy is estimated at about 8% in children¹, but applying limited diets in food-induced allergic patients lead to nutritional deficits particularly in early years of life in which the food allergens play an important role in growth and development of child.²The relationship between food and manifestation of allergy symptoms and its confirmation for accurate diagnosis is very important. Today, suggestions about a particular diet are the interested subjects of patients often used by some physicians for

patients and their treatment without any specific scientific reason.³ Allergic rhinitis is a common disease with a prevalence of 40% among different societies.⁴ Although some foods play a role on exacerbation of allergic rhinitis symptoms, there are controversies about the role of diet on incidence or worsening the symptoms.

Allergic rhinitis and immunological reaction to the food

The prevalence of food-induced allergic rhinitis appears to be less than 1 percent. In fact, allergic rhinitis is a rare and unusual

* **Corresponding author:** Dr. Mohammad Hasan Bermanian, Professor of Immunology and Allergy

Mailing address: Department of Immunology and Allergy, Faculty of Medicine, Tehran University of Medical Sciences, Ebne- Sina St., Tehran, Iran.

Tel & fax: +98 21 66517341-9

Email: mhbemanian@yahoo.com

manifestation of food allergy.⁴ There are some patients who suffer from itching and burning sensation on their throat associated with allergic rhinitis symptoms following consumption of some fruits and vegetables that all of the before mentioned symptoms are referred to oral allergy syndrome or Pollen-Food Allergy Syndrome (PFAS). The estimated prevalence of this syndrome is from 5% to 17% in different societies.^{5,6} An important clinical finding about this syndrome is that non-vegetated foods have no role in manifestation of the syndrome, however, they are considered as a common and important allergen. Therefore, the ingestion of some foods such as cow's milk, egg and seafood has no influence on the PFAS. On the other hand, some vegetables and fruits can produce an IgE-mediated food allergy due to structural similarities or homology with pollens of some plants especially during pollen season that is manifested by clinical symptoms of oral allergy syndrome characterized by burning sensation, pruritus, redness and edema of the oral mucosa pharynx and in some patients it is seen with frequent sneezing, itching of eye and nose and rhinorrhea.⁷ Structural similarity of sycamore pollen with hazelnut, peanuts, and fruits like peach, apple, kiwi, lettuce and corn cause allergic rhinitis symptoms in sensitive persons following consumption of these fruits.⁸ In patients who are hypersensitive to Mugwort pollen due to structural homology with some vegetables such as cabbage, parsley, caraway, anise, coriander, carrots and some spices like (aniseed), pepper, black pepper, garlic, onion, cauliflower, and broccoli allergic rhinitis symptoms and Oral Allergy Syndrome (OAS) are seen.⁹ Hypersensitivity to grass groups and homology of these groups with other fruits were less studied, but people with grass sensitivity are also sensitive to melon, potato, tomato, orange and Peanuts.¹⁰ Particular percentage of immunologic

reactions type I to foods and forming of OAS was described as syndromic diseases such as Celery- Mugwort- Spice- Syndrome in which patients show hypersensitivity to carrot, black pepper, parsley, anise and coriander.¹¹

Hypersensitivity to polypeptides contained in latex is very common in rubber production industries. Most of rubber materials such as car wheels, surgical gloves, and different kinds of soft rubber are made of latex and allergy to polypeptides contained in latex rubber have been reported specially among healthcare providers due to more exposure. Latex has a homology with some fruit allergens including banana, avocado, kiwi, peach, tomato, potato, pepper, and chestnut. So oral allergy syndrome and allergic rhinitis may occur in susceptible individuals to latex following consumption of these fruits.¹² Sometimes air born allergen of foods such as wheat in bakers rhinitis or meat in butcher or sea foods in worker of restaurant induce respiratory symptoms and clinical presentation of allergic rhinitis¹³.

Food reactions often lead to rhinitis symptoms at a non-immunologic nature. Therefore, it is not defined as allergy. For example, in subjects with gustatory rhinitis, symptoms are appeared following consumption of hot and spicy foods at a neurogenic pattern which are usually manifested by unilateral or bilateral watery rhinorrhoea a few minutes after ingestion of the foods but there are no complaints of nasal congestion or pruritus and facial pain.

It is stated that such reflex occurs due to adrenergic and cholinergic nerve dysfunction of the nose.¹⁴ Some foods and fruits due to their own natures cause local irritation in the tongue mucosa and throat without producing immunologic or neurologic reactions, as pineapple can cause such symptoms in the mouth and throat.

Sometimes patients are suffering from Burning Mouth Syndrome (BMS). BMS is

identified as a burning pain of the oral cavity and it is found more among female in middle-aged or older. The patient complains of a burning sensation more than itching sensation. Although some foods make the symptoms worsen, there is no correlation between food allergy and severity of symptoms.¹⁵

Conclusion

Although the role of food and fruits in developing allergic rhinitis is not clearly identified, in a very small percentage of patients, rhinitis is the clinical manifestation of food allergy. About 5-17% of patients with allergic sensitivity to pollens of trees, grass and weeds may have allergic reaction type I to some vegetarian meals including vegetables and fruits. Sometimes, foods as a stimulant or as a mediated by neurologic mechanisms can cause rhinitis symptoms that is not considered an allergic reaction.

Conflict of Interest

None declared.

Funding/Support

None declared.

References

1. Liu AH, Jaramillo R, Sicherer SH, et al. National prevalence and risk factors for food allergy and relationship to asthma: results from the National Health and Nutrition Examination Survey 2005-2006. *J Allergy Clin Immunol* 2010; 126:798.
2. Christie L, Hine RJ, Parker JG, Burks W. Food allergies in children affect nutrient intake and growth. *J Am Diet Assoc* 2002; 102:1648.
3. Settupane RA. Demographics and epidemiology of allergic and nonallergic rhinitis. *Allergy Asthma Proc* 2001; 22:185.
4. Raphael G et al. Gustatory rhinitis: a syndrome of food-induced rhinorrhea. *J Allergy Clin Immunol*. 1989 Jan;83(1):110-5.
5. Kleine-Tebbe J, Herold DA. [Cross-reactive allergen clusters in pollen-associated food allergy]. *Hautarzt* 2003; 54:130.
6. Osterballe M, Mortz CG, Hansen TK, et al. The prevalence of food hypersensitivity in young adults. *Pediatr Allergy Immunol* 2009; 20:686.
7. Eriksson NE, Wihl JA, Arrendal H. Birch pollen-related food hypersensitivity: influence of total and specific IgE levels. A multicenter study. *Allergy* 1983; 38:353.
8. Fernández-Rivas M, van Ree R, Cuevas M. Allergy to Rosaceae fruits without related pollinosis. *J Allergy Clin Immunol* 1997; 100:728.
9. Figueroa J, Blanco C, Dumpiérrez AG, et al. Mustard allergy confirmed by double-blind placebo-controlled food challenges: clinical features and cross-reactivity with mugwort pollen and plant-derived foods. *Allergy* 2005; 60:48.
10. Maeda N, Inomata N, Morita A, et al. Correlation of oral allergy syndrome due to plant-derived foods with pollen sensitization in Japan. *Ann Allergy Asthma Immunol* 2010; 104:205.
11. Wüthrich B, Dietschi R. [The celery-carrot-mugwort-condiment syndrome: skin test and RAST results]. *Schweiz Med Wochenschr* 1985; 115:258.
12. Nel A, Gujuluva C. Latex antigens: identification and use in clinical and experimental studies, including crossreactivity with food and pollen allergens. *Ann Allergy Asthma Immunol* 1998; 81:388.
13. Kalogeromitros D, Makris M, Gregoriou S, et al. IgE-mediated sensitization in seafood processing workers. *Allergy Asthma Proc* 2006; 27:399.
14. Raphael G, Raphael MH, Kaliner M. Gustatory rhinitis: a syndrome of food-induced rhinorrhea. *J Allergy Clin Immunol* 1989; 83:110.
15. Minor JS, Epstein JB. Burning mouth syndrome and secondary oral burning. *Otolaryngol Clin North Am* 2011; 44:205.