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CLINICAL VIGNETTE

Oral Allergy Syndrome

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Case Report

The patient is a 35-year-old male with a history of childhood asthma and allergic rhinitis who began to experience episodes of oral angioedema over the past few ten years. Starting in his mid-20's, symptoms began to occur once or twice per year. Over the course of the past five years, symptoms have occurred more frequently and now occur weekly. Episodes can affect various parts of the face and can vary in intensity and duration. Some involve the upper right lip while other episodes involve the lower left lip. Some involve the cheek while others involve the tissues surrounding one of the eyes. The patient has been to the emergency room several times and received courses of steroids and anti-histamines. Testing revealed a CBC with a slight eosinophilia of 12% but other labs including chemistries and thyroid function were within normal limits. Complement levels and the C1-esterase inhibitor level was normal. Total IgE was normal.

His past medical history is remarkable for GERD and multiple episodes of otitis media as a child. He takes no medications and has no drug allergies. He does not smoke or drink alcohol. His family history is unremarkable.

Vital signs included blood pressure of 120/78 mm hg., pulse of 64 beats/minute and temperature of 36.7 C, Physical examination was unremarkable except for nasal and sinus congestion consistent with allergic rhinitis.

General Discussion

Oral allergy syndrome is a common IgE-mediated syndrome typically found in pollen-sensitized adults. Episodes (usually contact urticaria) usually occur in or near the mouth from cross-reactivity to protein founds in certain fruits, vegetables, nuts, or other foods[1]. It is one of the most common allergy-mediated processes in adults and has been described under various names including "pollen-food allergy syndrome", "pollen-food syndrome," and "pollen-associated food allergy syndrome"[2]. These reactions are believed to be due to cross-reactions between allergens in pollen and homologous allergens in plant foods[3]. Non-plant foods such as eggs, seafood, and cow's milk tend not to be associated with this syndrome. Patients usually report edema and itching of the mouth and surrounding areas shortly after ingesting uncooked fruits, vegetables, or nuts[4]. While cooking often eliminates the possibility of cross-reactivity, freezing foods does not appear to affect the risk[5]. Unlike other food allergy syndromes, most reactions in oral allergy syndrome are limited to the mouth, lips, tongue and throat[6]. Anaphylaxis, intestinal symptoms, and hemodynamic changes are rarely seen in these patients[7]. Clinical manifestations usually include itching, tingling, and swelling of the lips, throat, palate, nasal passages or oral mucosa shortly after the ingestion of the offending food. Most of these patients have seasonal pollen allergies, but some may not appear to react to pollen[6]. Birch pollen-allergic patients are more likely to develop oral allergy syndrome than those who are sensitized to other types of pollen[8].

Epidemiology

The prevalence of this syndrome is not clearly defined but it is felt to be fairly common occurring in at least 5% of the population[4]. Risk factors include sensitization to tree pollen or other pollens, coexistent allergy-related problems, and living where environmental exposure to pollen is high[9]. Symptoms related to oral allergy syndrome can occur any time of year but are more common during the pollen season(s)[10]. Most patients with food allergy syndrome have a history of atopic disorders including asthma, eczema, and allergic rhinitis[11].

Etiology and Pathogenesis

Fruit and vegetable proteins have a high degree of structural homology to pollen allergens[12]. The symptoms associated with this disorder are believed to result from contact-related urticaria caused by IgE-mediated reactions to pollen-related proteins found in certain foods[13]. Patients with this disorder have produced IgE antibodies against pollen and these antibodies cross-react with other structurally similar proteins found in ingested foods[14]. A complex cascade involving mast cells, T-cells, and inflammatory mediators result in the signs and symptoms of this syndrome[15]. Some individuals react to

only one food type while others react to many foods[16]. The allergenic proteins felt to triggers these reactions are usually destroyed during the cooking process. Thus, cooked foods (with a few exceptions such as nuts and celery) are much less likely than raw foods to be problematic[5]. Antibodies that trigger oral allergy syndrome react to the linear amino acid sequence of the protein or to a conformational epitope of the protein. Cooking food tends to alter the conformational epitope but not the amino acid sequence[17]. If the immune response is to the conformational epitope, then the person with oral allergy syndrome may be able to eat the food if it is cooked, but not when it is raw. If the response is to the linear sequence (common in tree pollen/nut allergies), then cooking usually has no effect on the allergic process[18]. In most cases patients can tolerate the culprit food in any cooked form, with tree nuts and peanuts being two exceptions[19].

Food-allergy patients who are allergic to certain types of pollens (tree, weed, and grass) tend to react to certain types of foods. For example, patients who are allergic to grass pollen are more likely to react to melon, tomatoes, and oranges[20]. Patients who are allergic to alder pollen are more likely to react to almonds, apples, peaches, and strawberries[14]. Patients with ragweed pollen allergies are more likely to react to bananas, green peppers, and honey[14]. Patients with birch pollen allergies are more likely to react to celery, cherries, plums, soy, and wheat[14]. Although there are statistical correlations between various types of pollen and types of foods, some people react to only one food while others react to many foods.

Interestingly, latex allergens (like pollen) can also sensitize patient to cross-react to protein found in some foods including banana, kiwi, tomato, and avocado[21]. Many of these reactions can be systemic and severe in nature[22]. In addition, some patients developed oral allergy syndrome through cross reactions to nonspecific lipid transfer proteins which belong to the prolamin superfamily of plant proteins[23].

Diagnosis and Testing

The evaluation of these patients centers on a detailed, accurate historical record of the circumstances surrounding the patient's symptoms, physical examination, objective allergy testing to confirm pollen sensitization (usually with IgE RAST testing, skin testing, and patch testing), and an elimination diet leading to a reduced incidence of symptoms[24]. A food challenge is often advocated by specialists to more accurately determine whether a certain food predictably elicits a reaction. Prick testing, patch testing, and RAST IgE testing are used as adjuncts to history taking, elimination protocols, and food challenges[25]. In addition, prick testing with samples of fresh foods may be more reliable and less likely to result in false negative testing than more unstable commercially available extracts[26]. A diagnostic questionnaire for oral allergy syndrome patients has been developed and validated[27].

Treatment and Prognosis

Once proper diagnostic testing has been performed, treatment of oral allergy syndrome involves avoiding the offending foods and treating the pollen-induced allergic process. Avoidance of the specific fruits and vegetables that have triggered reactions is the mainstay of treatment. Severe reactions on first exposure to an allergen are rare but can occur[28]. Severe reactions to foods that were previously tolerated can also occur[29]. The decision as to whether to simply avoid the uncooked versions of certain foods or all versions of such foods needs to be made case by case. Desensitization to the pollen with immunotherapy is recommended in some cases and can sometimes help minimize cross-reactions[30]. Peeling or cooking foods may also help minimize or eliminate reactions to foods to which the patient is sensitive[9]. When the offending agents cannot be isolated or avoided or when symptoms persist despite the above measures, anti-histamines can help prevent and control episodes[31]. Oral steroids are also sometimes prescribed in certain clinical circumstances[32]. An epinephrine pen is also often prescribed to patients to be used in the rare circumstance of systemic anaphylaxis. This is particularly important for patients with a history of a reaction to cooked foods, a history of systemic or pharyngeal reactions, reactions to foods with a higher rate of severe reactions (peanuts, celery, tree nuts, peaches, and mustard), or those at higher risk for pharyngeal occlusion[33]. Immunotherapy has also been used with some level of effectiveness in cases of food allergy syndrome. For example, immunotherapy with extracts of birch pollen has been show to reduce the incidence of apple related episodes[34]. Some allergists caution these patients to avoid medications that increase gastric pH as preliminary studies suggest that a higher gastric pH may reduce the digestion of some proteins and could increase the risk of some allergic reactions[35]. Treatment with anti-IgE therapy is as of yet unproven but may hold some promise[36].

Unfortunately, there are limited data to assess the prognosis for these patients. The long term consequences of continuing to ingest foods that trigger such reactions are also unknown. Systemic reactions are uncommon but can occur even in those without a history of severe reactions[37].

Clinical Course and Follow-Up

The 35-year old patient was diagnosed with food allergy syndrome. After a careful review of his food inventory, it appeared that most of his episodes occurred about the ingestion of apples, plums, and cherries. On skin testing, the patient tested positive for birch pollen. The patient was instructed to avoid apples, plums, and cherries and immunotherapy for birch pollen was initiated. He was also instructed to fully cook fruits and vegetables whenever possible. After the above measures were instituted and the frequency of episodes dramatically decreased over the course of several months.

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