

Oral Allergy Syndrome Precipitation and Sprouted-Grain Bread: A Case Report

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Abstract: *Oral allergy syndrome (OAS), a class 2 food allergy, occurs when individuals sensitized to plant pollens ingest foods containing allergens homologous to the plant pollen. Common trigger foods include fruits, vegetables, and nuts, and when consumed, they result in oropharyngeal pruritis, tingling, and edema. Here, we report the case of a 28-year-old female with a history of allergy and exercise-induced asthma who presented with oral urticaria, lower lip edema, and tingling of the lips, mouth, and tongue after switching her daily consumption of whole-wheat bread to sprouted-grain bread. The patient discussed the symptoms with her pharmacist, who suggested OAS as a possible diagnosis and an elimination diet as an initial treatment. She removed fruits and vegetables from her diet, but coincidentally noticed that the ingestion of sprouted-grain bread consumed only during her work week triggered the reaction. The diagnosis of OAS and the implementation of an elimination diet that excluded the sprouted-grain bread provided a successful treatment strategy for the OAS in this patient, and such therapy can be easily carried out by a wide variety of practitioners who are well positioned to offer such assistance.*

Keywords: oral allergy syndrome; pollen-food allergy syndrome; pollen-food syndrome; sprouted-grain bread

Several companies have recently begun producing sprouted-grain bread due to an increasing consumer demand for the grain variety. Sprouted-grain bread features grains that have undergone the germination process, or sprouted.¹ Sprouted-grain bread has been shown to lower the glucose response and increase the glucagon-like peptide-1 response.¹ These benefits have led to consumers replacing white breads with

sprouted-grain varieties. To date, there have been no reports of increased oral allergy syndrome (OAS) or pollen-food allergy syndrome (PFAS) associated with consumption of sprouted-grain bread. We report a case of a 28-year-old female with new onset OAS after switching from whole-wheat bread to sprouted-grain bread for health benefits.

Presentation

A 28-year-old female began experiencing oral urticaria, lower lip edema, and tingling of the lips, mouth, and tongue after switching her daily consumption of whole-wheat bread to *Food for Life Ezekiel 4:9 Sprouted-grain Bread*. Listed ingredients on the packaging of the bread included organic sprouted whole wheat, filtered water, organic malted barley, organic sprouted whole millet, organic sprouted whole barley, organic sprouted whole lentils, organic sprouted whole soybeans, organic sprouted whole spelt, fresh yeast, organic wheat gluten, and sea salt.² The patient had been diagnosed at age 6 with allergic and exercise-induced asthma, which was managed during childhood with trigger avoidance, inhaled corticosteroids, as needed bronchodilators, and antihistamines. The patient began noticing bothersome symptoms shortly after introducing the new bread, but the pruritis, edema, and urticaria worsened over the course of 6 weeks. When sprouted-grain bread was consumed as part of her lunch, symptoms persisted throughout the day and worsened with the consumption of other snacks such as wheat crackers or fruit. She began successfully self-treating with either loratadine or cetirizine after onset of symptoms.

Diagnosis

The patient approached her pharmacist with her symptoms. After questioning the patient, the pharmacist discovered that

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the typical, type 1 food-allergy symptoms such as shortness of breath, widespread urticaria, gastrointestinal disturbances, and wheezing were absent. The pharmacist suggested OAS as a possible diagnosis and an elimination diet as initial treatment. Since OAS is most commonly associated with raw fruits and vegetables, these foods were eliminated first. Bread was considered an unlikely cause of the OAS; and therefore, its consumption was continued.

Several weeks after the initial diagnosis, the patient consumed a sandwich made with sprouted-grain bread and became symptomatic, noting urticaria, lower-lip swelling, and pharyngeal itching. The onset of symptoms after the consumption of sprouted-grain bread led the patient to the realization that her symptoms were often only present during the work week when she ate her packed lunch of sandwiches made with sprouted-grain bread. She realized that she rarely had symptoms on the weekends, where her diet did not include the bread.

The patient presented to her allergist for skin prick testing (SPT). The results were negative for gluten but positive for casein, tomato, apple, shellfish, brewer's yeast, string beans, cabbage, mustard, sprouts, and peach (producing wheal greater than 3 mm with surrounding erythema). Even with positive SPT, the patient did note that peeled tomatoes used in sauces or salsa, peeled or cooked apples, and peeled peaches did not elicit the OAS symptoms.

Management

The patient was provided a self-administered epinephrine pen for cases of emergency and instructed to keep the pen with her at all times due to the worsening of symptoms with the consumption of sprouted-grain bread. The patient was instructed to remove sprouted-grain bread from her diet and to continue treating oral allergy symptoms with loratadine or cetirizine.

Outcome

After elimination of sprouted-grain bread from the patient's diet, OAS symptoms greatly improved and the patient is able to pretreat with antihistamines before consumption of known trigger fruits and vegetables.

Discussion

Instances of OAS have been reported in the literature as early as 1942.³ OAS occurs when individuals who are sensitized to plant pollens ingest certain fruits, vegetables, and nuts that contain allergens homologous to the plant pollens.⁴ The reaction to the allergen is an IgE-mediated hypersensitivity, and symptoms usually include itching, tingling, and swelling of lips, mouth, and tongue. The symptoms are most often limited to the oropharyngeal area during contact with the irritant, as the allergens are quickly inactivated by gastric enzymes once swallowed. OAS refers to reactions that are limited to

the oropharyngeal area, whereas PFAS is a broader term that includes reactions of the oropharyngeal area that may extend to include systemic symptoms. Typical allergens capable of producing OAS, a class 2 food allergy, differ chemically from those commonly associated with class 1 food allergies.⁵ Class 1 allergens are not inactivated by gastric enzymes and result in the associated gastrointestinal symptoms.

Class 1 food allergies also feature an onset in early childhood, skin and respiratory disturbances, and persistence of symptoms despite cooking, preserving, or canning. In contrast, class 2 food allergies such as OAS usually present in adolescence or adulthood, involve only the oral-pharyngeal area, are associated with history of atopy, and are minimized by cooking the associated foods. Although usually present in adolescents or adults, some children do experience OAS, as reported recently by De Knop et al, particularly in birch-endemic regions. In this particular study, immunoassay revealed similar pathology in both adults and children experiencing OAS to unprocessed hazelnuts with cross-reactivity to birch pollen and no systemic reactions.⁶

Treatment for both class 1 and 2 allergies includes an elimination diet. Treatment for OAS may also include immunotherapy or simply cooking the associated foods. Prescribing self-injectable epinephrine is an option available to allergists and other practitioners for OAS management. Although in most cases OAS symptoms are localized to the oral-pharyngeal area, it is estimated that 8.7% of patients diagnosed with OAS experience symptoms outside the gastrointestinal tract and 1.7% of patients experience anaphylactic shock.⁷ A survey by Ma et al indicated that 3% of practitioners always prescribe self-injectable epinephrine, 67% make the decision to prescribe it on a case-by-case basis, and 30% never prescribe self-injectable epinephrine after OAS diagnosis.⁷ Currently, no clinical guidelines exist to help practitioners make this decision. In this case, the patient's worsening OAS symptoms on continued exposure to the allergen and other triggers and the risk of potential anaphylaxis led to the clinical decision to prescribe self-injectable epinephrine.

Asthma and allergy educators are uniquely positioned to help patients distinguish between the symptoms of OAS versus those of class 1 food allergies. Educators can help patients identify triggers, especially those that may be unique to the patient and not commonly associated with OAS. Asthma and allergy educators should familiarize themselves with the presentation and treatment of both class 1 and class 2 food allergies. An elimination diet may offer a simple solution for both class 1 and 2 food allergies and can be easily implemented by a variety of practitioners. When no systemic reaction has been documented and only OAS symptoms occur, asthma and allergy educators can individualize a plan with each patient weighing the burden of symptoms versus the patient's desire to continue consumption of the trigger food.

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