

Anaphylaxis to dill

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Background: Allergic symptoms caused by spices and herbs are infrequent and usually mild, although occasionally, severe allergic reactions do occur. Symptoms of pruritus, rhinitis, cough, and edema have been reported to spices including curry, paprika, pepper, and mustard. To our knowledge, this is the first case of confirmed dill allergy, and the patient had severe allergic symptoms.

Objective: It is important to alert physicians to the possibility of allergic reactions caused by dill.

Methods and Results: The patient, who has a history of allergic rhinitis, developed symptoms of oral pruritus, tongue and throat swelling, urticaria, and immediate vomiting and diarrhea following ingestion of foods cooked with dill and subsequently with inhalation of foods prepared with dill. Skin testing with fresh dill preparation was positive.

Conclusion: These findings confirm that dill can cause IgE-mediated reactions.
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INTRODUCTION

Spices and herbs are commonly used in cooking, but allergic reactions to these ingredients are uncommon, or rarely reported.^{1–9} Dill, *Anethum graveolens*, is considered both an herb and a spice, and is classified in the parsley or carrot family (*Apiacea*). It is native to the Mediterranean countries and southern Russia. All parts of the plant are aromatic, with a sharp but sweet aniseed flavor. Its seeds are widely used in Scandinavian, German, and central and eastern European cuisine. Historically, it was used medicinally for its soothing effect, and its name originates from a Saxon word meaning “to lull.” No previous reports of adverse reactions to dill were discovered after a review of the literature.

CASE REPORT

The patient is a 40-year-old Caucasian woman with a history of seasonal and perennial allergic rhinitis that had been well controlled with topical nasal corticosteroids and antihistamines. She complained that whenever she ate foods containing or flavored with dill, she would develop immediate palatal itching with progression to generalized urticaria, throat tightness, vomiting, and diarrhea. Her symptoms had been progressing with each subsequent exposure, and at the time of presentation, would occur even with inhalation of foods cooked with dill.

Her past medical and family history was remarkable for seasonal (including trees, grass, ragweed, and mold) and perennial (dust mite) allergic rhinitis. She had tree nut allergy, diagnosed as a child, and she had been avoiding nuts. Her physical examination was normal.

METHODS

Commercial radioallergosorbent testing (RAST)(Quest Diagnostics, Inc, San Juan Capistrano, CA) to a variety of

foods including dill was negative. Percutaneous skin testing using Derma-Pik device (Greer, Lenoir, NC) with common commercial food extracts (Greer, Lenoir, NC) including tree nuts (walnut, almond, pecan) was negative, with a positive histamine control (Histamine 1.8 mg/mL, Allermed, CA), and a negative saline control (Greer, Lenoir, NC). Dill seeds were purchased at a local food store, and fresh dill extract was prepared by crushing 10 dill seeds to a rough powder with a mortar and pestle, and mixing them in approximately 5 mL of normal saline. The solution was incubated at room air for approximately 2 hours. Percutaneous skin testing with this fresh dill seed extract using the Derma-Pik device was positive in our patient, with the reaction equal to the histamine control (histamine = 28 mm flare and dill = 30 mm flare). Skin testing with fresh dill extract on 8 adult controls (4 atopic and 4 nonatopic) was negative. In-house ELISA assay for specific IgE and IgG4 with washed dill seeds purchased from the store was negative for IgE but positive for IgG4 compared with adult exposed controls. Confirmatory inhibition assay was positive as well.

DISCUSSION

Allergies to spices and herbs are infrequent and usually mild.^{1–9} Similar to other food allergens, spice exposure can occur via inhalation or ingestion.^{3,7} Dill belongs to the parsley or carrot family (*Apiaceae*) which includes carrots, celery, and other spices like fennel, parsley, and parsnip. To our knowledge, this case represents the first report of a severe allergic reaction to dill.

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Allergic reactions to spices occur almost exclusively in patients who have a history of pollen-induced allergic rhinitis. Celery and spices have been associated with allergy to the weed mugwort.^{5,6,10} This is not surprising as weeds and herbs are considered in the same botanical classification. Other common examples of edible herbs within this classification include chamomile and sage in the mayweed tribe (*Anthemideae*) of the Aster family, and broccoli, cabbage, turnip, and mustard in the mustard family (*Brassicaceae*). Specific spices including aniseed, fennel, cumin, and coriander may cross-react, suggesting cross-reactivity among the *Betulaceae* and *Apiaceae* families.⁴ These cross-reactive proteins are believed to be due to thermolabile allergens.¹¹

Our patient had a history of seasonal (tree and weed) and perennial allergic rhinitis. She also had mild anaphylactic symptoms upon ingestion and inhalation of foods cooked with dill. Skin testing to commercial extracts of foods and commercial RAST testing, including dill was negative. Skin testing with fresh dill extract demonstrated a positive reaction; thus, dill allergy was confirmed. In-house ELISA assay using washed dill seeds evaluating for serum-specific IgE and IgG4 was negative for IgE, but positive for antigen specific IgG4. The ELISA for antigen-specific IgG4 has been of interest due to the possibility that these antibodies bind to human basophils and are involved in the promotion of the release of histamine from sensitized cells.¹² Direct oral

challenge testing to dill was not performed in light of her severe allergic symptoms and the risk to the patient. Spices contain essential oils and other substances that have been surmised to elicit skin irritation thereby making skin test interpretation difficult. As the control group did not experience skin reactions to the fresh dill seed extract, it would not seem that the prepared extract elicited an irritant reaction. Previous commercial RAST studies with celery have failed to identify specific serum IgE in all patients. This has been attributed to the inadequacy of the supplied material,¹⁰ thus emphasizing the importance of fresh extracts for skin testing.

Dill allergy can present as a severe allergic reaction, and may be triggered by both inhalation and ingestion. When commercial preparations fail to identify the allergen, fresh extracts may be required.

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REFERENCES

1. Niinimäki A, Björkstén F, Puukka M, et al. Spice allergy: results of skin prick tests and RAST with spice extracts. *Allergy* 1989;44(1):60–65.
2. Niinimäki A, Hannuksela M. Immediate skin test reactions to spices. *Allergy* 1981;36(7):487–493.
3. Olive-Perez A, Granel Tena C. Asthma caused by culinary spices. *Allergol Immunopathol* 1981;20(2):85–86.

4. Stager J, Wuthrich B, Johansson SGO. Spice allergy in celery-sensitive patients. *Allergy* 1991;46(6):475–478.
5. Stager J, Wuthrich B. Association de l'allergie au celeri a l'allergie aux épices. Resultats des RAST aux épices chez des patients présentant une allergie au celeri. *Rev Fr Allergol* 1987;27:137–141.
6. Stager J, Wuthrich B. L'allergie croisée celeri-épices-bouleau-armoise. *Med Hyg* 1988;46:1654–1657.
7. Urugoda CG. Symptoms in spice workers. *J Trop Med Hyg* 1992;95(2):136–139.
8. Van Toorenbergen AW, Dieges PH. Immunoglobulin E antibodies against coriander and other spices. *J Allergy Clin Immunol* 1985;76(3):477–481.
9. Van Toorenbergen AW, Dieges PH. Demonstration of spice-specific IgE in patients with suspected food allergies. *J Allergy Clin Immunol* 1987;79:108–113.
10. Pauli C, Bessot JC, Dietemann-Molard A. Celery sensitivity: clinical and immunological correlations with pollen allergy. *Clin Allergy* 1981;15:273–279.
11. Wuthrich B, Stager J, Johansson SGO. Celery allergy associated with birch and mugwort pollinosis. *Allergy* 1990;45:566–571.
12. Fagan DL, Slaughter CA, Capra JD, et al. Monoclonal antibodies to immunoglobulin G4 induce histamine release from human basophils in vitro. *J Allergy Clin Immunol* 1982;73:399.

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