

Cumin anaphylaxis: A case report

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Herbs and spices are more commonly being recognized as causative agents for food-induced anaphylactic reactions. Systemic reactions caused by oregano,¹ thyme,¹ coriander,² and caraway seed³ have all been described. The patient described had experienced multiple allergic reactions after various ingested meals, but the cause of these reactions had not been investigated.

CASE REPORT

The patient is a 68-year-old woman who was first seen with an episode of nausea associated with shortness of breath, itching of her genitalia and hands, and vomiting—all of which started within a few minutes after eating a falafel (mixture of chickpeas, ground cumin, garlic, sesame seeds, lemon and black pepper formed into a ball and deep-fried in either soy or vegetable oil). The patient was treated in a local emergency department with diphenhydramine and methylprednisolone with eventual resolution of her symptoms.

The patient reported similar symptoms after eating various restaurant meals, but she was uncertain of the foods eaten just before the onset of each of the reactions. She did report a history of hives and vomiting after the ingestion of akee, and she diligently avoided further ingestion of akee.

The patient was advised to obtain all of the ingredients in the falafel. A review of the foods ingested included sesame seeds, onion, tomato, lettuce, chickpeas, black pepper, parsley, cumin, garlic, lemon, and soybean oil.

Skin prick testing was performed with each of the above-mentioned ingredients. Commercial skin tests were used for sesame seed, onion, tomato, lettuce, and soybean. For skin testing, extracts of chickpea, black pepper, parsley, cumin, garlic, and lemon were prepared with either fresh or dried material purchased at a local supermarket. The patient had positive reactions to sesame seed, cumin, and chick pea. Both positive and negative control tests were performed as well. Two control patients with no history of food anaphylaxis were tested and did not react to these prepared extracts. The patient reported eating sesame seeds and chick peas since the above-mentioned reaction with no adverse allergic symptoms. The patient did not recall eating any food containing cumin since the most recent anaphylactic reaction. The patient did not recall ever adding cumin to any home-prepared meals.

Given the risk of anaphylaxis, an oral challenge with cumin was not performed.

Abbreviation used

PBS-T: Phosphate-buffered saline-Tween-20

METHODS

The ELISA was performed according to standardized methods.^{4,5} Cumin powder, an aromatic spice used for seasoning in food, was supplied by the patient. Cumin powder was extracted in carbonate buffer (pH 9.6) at 100 mg/ml and centrifuged at 2800 rpm for 15 minutes in an IEC Centra-7R refrigerated centrifuge (International Equipment Company, Damon Division, U.S.A.). The supernatant was removed and used without further dilution to coat the Immulon flat-bottom microELISA plates (Nunc, Roskilde, Denmark). Cumin extract, 200 μ l per well, was incubated in the ELISA plates at 4° C for 18 hours. The plates were emptied and washed three times with phosphate-buffered saline-Tween-20 (PBS-T). The patient's serum was diluted serially in PBS-T; 100 μ l per well of each dilution was added and incubated at 37° C for 30 minutes, serum was removed, and the plates were washed three times. The following reagents were added to the wells in sequence with appropriate incubation and washes between each step: rabbit anti-human IgE diluted 1:1000 in PBS-T, goat anti-rabbit IgG, alkaline phosphatase conjugate (Sigma) diluted 1:4000 in PBS-T, and finally enzyme substrate p-nitrophenyl phosphate (Sigma 104 phosphate), 1 mg/ml, in 10% diethanolamine buffer (pH 9.8). After 2 hours of incubation at 37° C, the optical density of each well was read at 405 nm in a Biotek Model EL-312 Automatic ELISA reader (Biotek, Inc., Winooski, Vt.). The end-point titer for the assay was the last dilution at which the test serum had an optical density reading that was at least twice that of the mean of two nonatopic control sera.

Inhibition of IgE binding to cumin extract

The supernatant from cumin powder extracted in PBS-T at 100 mg/ml was used to dilute the patient's serum. The samples were incubated for 15 minutes at 37° C before they were added to the wells coated with cumin. The inhibition assay was carried out in the same ELISA plate and at the same time as the regular assay. Complete inhibition was achieved with the cumin extract by using the patient's serum diluted 1:2, 1:5, and 1:10 as shown in Table I.

DISCUSSION

Allergic reactions to spices should be considered in a patient with food-induced anaphylaxis. This report demonstrates both in vivo and in vitro evidence of allergic sensitivity to cumin in a patient with food-induced anaphylaxis.

To determine the cause of a food-induced anaphylac-

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TABLE I. ELISA for detection of IgE antibody to cumin extract

Serum dilution	Patient serum	Control serum	Optical density at 405 nm
			Patient serum inhibition
1:2	0.345	0.200	0.010
1:5	0.346	0.123	0.022
1:10	0.232	0.071	0.003
1:20	0.140	0.038	—
1:40	0.085	0.031	—

tic reaction, all suspicious ingredients must be considered. Preparation of fresh food extracts for extracts commercially unavailable can be helpful in determining the cause of an anaphylactic reaction.

The causative agent for a food-induced anaphylactic reaction can be determined in the presence of a motivated patient, cooperative restaurant, and physician willing to perform some basic investigative work.

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