

The bulk of reports of side chain-specific β -lactam allergy have emanated from Spain and involve the aminopenicillins, ampicillin and amoxicillin.^{3, 4} Fewer reports relate to cephalosporins, and a literature search revealed only one such report from North America.⁵ Interestingly, this report was of four cases of anaphylaxis to intravenous cefazolin given before surgery.

A number of conclusions can be drawn from this report: (1) side chain-specific cefazolin allergy appears to be uncommon (0.1% or less); (2) the incidence of false-positive intradermal cefazolin skin test results (1 mg/ml) is low; (3) a positive cefazolin skin test response, especially in conjunction with a history of a clinical reaction to cefazolin, should be considered highly clinically significant; and (4) an isolated positive cefazolin skin test response warrants additional skin testing and oral or parenteral chal-

lenge testing to identify side chain-specific allergy with good tolerance to other β -lactams.

REFERENCES

1. Mendelson LM, Ressler C, Rosen JP, Selcow JE. Routine elective penicillin allergy skin testing in children and adolescents: study of sensitization. *J Allergy Clin Immunol* 1984; 73:76-81.
2. Saxon A, Beall GN, Rohr AS, et al. Immediate hypersensitivity reactions to beta lactam antibiotics. *Ann Intern Med* 1987;107:204-15.
3. Blanca M, Perez E, Garcia J, et al. Anaphylaxis to amoxicillin but good tolerance for benzylpenicillin. *Allergy* 1988;43: 508-10.
4. Blanca M, Vega J, Garcia J, et al. Allergy to penicillin with good tolerance to other penicillins. *Clin Exp Allergy* 1990; 20:475-81.
5. Warrington R, McPhillips S. Unpredictable anaphylaxis to cefazolin without allergy to other beta-lactams [abstract]. *J Allergy Clin Immunol* 1995;95:284.

Oral allergy syndrome after ingestion of salami in a subject with monosensitization to mite allergens

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In the last few years, interest in the etiologic and clinical aspects of oral allergy syndrome (OAS) has increased. Symptoms include oral pruritus and irritation and swelling of the lip, tongue, palate, and throat. This local symptomatology may sometimes be associated with other clinical symptoms (e.g., rhinoconjunctivitis, asthma, urticaria-angioedema, and anaphylactic shock).¹

Symptoms of OAS usually occur a few minutes after consumption of the offending food, particularly fresh fruits and vegetables (e.g., apple, hazel-

Abbreviation used

OAS: Oral allergy syndrome

nut, peach, tomato, carrot).² Moreover, OAS has been reported to be common in patients with birch, ragweed, or grass pollinosis, because in most cases there are cross-reacting allergens (e.g., profilins).

Rarely is OAS induced by the ingestion of other foods in subjects without pollen sensitization.³ Even if the wide consumption of pork, systemic and cutaneous manifestations after the ingestion of this food are uncommon in comparison with other foods such as milk, eggs, and fish.

In this report we describe an unusual case of OAS (without systemic manifestations) after the ingestion of salami, which was made by a local sausage maker, in a subject with exclusive nasal sensitization to *Dermatophagoides* allergens.

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TABLE I. Results of cutaneous and serologic diagnostic tests

	SPT with allergenic extract		PPT with fresh food (salami)		Serologic IgE assay		
	Class	Wheal area (mm ²)	Class	Wheal area (mm ²)	Class	kU/L	
<i>D. pteronnyssinus</i>	++++	91	NA	NA	6	>100	Specific IgE
<i>D. farinae</i>	++++	90	NA	NA	6	>100	Specific IgE
Pork	++	28	++	42	2	2.60	Specific IgE
Histamine (positive control)	+++	51	NA	NA	NA	1256	Total IgE

SPT, skin prick test; PPT, prick prick test; NA, not applicable.

CASE REPORT

We observed a 21-year-old woman with a history of perennial rhinoconjunctivitis and monosensitization to *Dermatophagoides pteronnyssinus* and *D. farinae*. In the last few years, she had experienced mild pruritus in oral mucosa after eating salami that was made by a local sausage maker and produced without use of additives (e.g., preservatives, antioxidants, and colorants).

Two months before the tests were performed, she experienced severe OAS without symptoms of systemic involvement immediately after she ate a sandwich containing some slices of salami. For this reason, she was admitted to the emergency care unit of our hospital and treated with parenteral administration of antihistamines and corticosteroids. The patient reported frequent consumption of cooked pork without any problem. The offending uncooked food contained only pork, salt, and a small quantity of paprika.

METHODS

Examination of the patient included cutaneous, serologic, and provocative diagnostic tests with commercially available allergenic extracts and reagents. Informed consent was also obtained.

A skin prick test was carried out according to the method of Aas and Belin⁴ by using standardized allergenic extracts for common inhalant allergens and the most important foods (Dome-Hollister-Stier-Bayropharm, Milan, Italy). Wheal areas were also calculated.

Prick prick testing was done according to the method of Dreborg and Foucard⁵ with the same fresh food eaten by the patient. The same lancet was used for pricking first the salami and then the skin of the patient's forearm.

A serum sample was obtained for total and specific IgE determination (Pharmacia CAP system FEIA; Pharmacia Diagnostics, Uppsala, Sweden).

Open challenge with food was done according to instructions given in a European Academy of Allergology and Clinical Immunology position paper⁶ by using a slice of salami that weighed about 6 gm; the patient put this food into her mouth, chewed it for 1 minute, and then spat it out. The use of an open challenge with food (without placebo) was justified by the need for adequate

contact of the suspected food with the oral mucosa and the difficulty of obtaining a dehydrated form of this food and a masked vehicle. We did not perform an oral challenge test with paprika because the patient frequently ate this spice together with different foods without any problem.

RESULTS

The results of cutaneous and serologic tests are shown in Table I. Our patient exhibited allergic sensitization only to allergens of *Dermatophagoides* and pork. Open challenge with fresh food induced, after a few minutes, the appearance of intraoral itching and angioedema of the lips and tongue, which required the administration of an antihistamine (terfenadine: 1 tablet of 120 mg by mouth) and corticosteroids (methylprednisolone: 40 mg administered parenterally).

DISCUSSION

To our knowledge, there are no documented reports of OAS after the ingestion of salami in patients with sensitization to dust mite allergens.

Our report is in agreement with the view that OAS may be induced especially by labile allergens of fresh foods; in fact, the cooking process frequently destroys the majority of allergenic proteins.

Although our patient currently eats cooked pork without problems, the salami, which is produced with dried but uncooked pork, evidently contains active allergens that are able to induce oral symptoms. Because the pigs were raised on a small farm and the salami was made by a local sausage maker, we exclude the possibility of reactions to other components (e.g., preservatives, antioxidants, colorants, and contaminants such as antibiotics and hormones).

Therefore we conclude that allergy to pork (if eaten in salami) may induce OAS, as well as cutaneous or systemic disorders.

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REFERENCES

1. Ortolani C, Ispano M, Pastorello EA, Ansaloni R, Magri GC. Comparison of results of skin prick tests (with fresh foods and commercial food extracts) and RAST in 100 patients with oral allergy syndrome. *J Allergy Clin Immunol* 1989;83:683-90.
2. Pastorello EA, Ortolani C, Farioli C, Pravettoni V, Ispano M, Borga A, et al. Allergenic cross-reactivity among peach, apricot, plum, and cherry in patients with oral allergy syndrome: an in vivo and in vitro study. *J Allergy Clin Immunol* 1994;94:699-707.
3. Liccardi G, D'Amato G. Oral allergy syndrome (OAS) in a subject with a highly relevant monosensitization to egg. *J Allergy Clin Immunol* 1994;94:931-2.
4. Aas K, Belin L. Standardization of diagnostic work in allergy. *Acta Allergol* 1972;27:439-68.
5. Dreborg S, Foucard T. Allergy to apple, carrot and potato in children with birch pollen allergy. *Allergy* 1983;38:161-72.
6. Bruijnzeel-Koomen C, Ortolani C, Aas K, Bindslev-Jensen C, Björkstén B, Moneret-Vautrin D, et al. Adverse reactions to food (Position paper). *Allergy* 1995;50:623-35.