

Adult-onset sensitization to casein after occupational exposure to aerosolized Tryptone powder

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Occupational allergic diseases are generally underreported, in part because of the worker's reluctance to com-

plain and the lack of an index of suspicion by the clinician. A wide array of causative substances have been implicated in occupational asthma and rhinitis.^{1,2} Among the plethora of articles in the literature, there was a recent report that described occupational sensitivity to a common laxative, psyllium, in an adult.³ Here we report a case of milk protein sensitivity that started in adult life from laboratory exposure by the inhaled route.

CASE REPORT

A 44-year-old male scientist was evaluated for a recent systemic allergic reaction after consumption of a candy containing cow's

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milk. The patient had rhinorrhea, periocular pruritus, tearing, generalized pruritus, flushing, and dizziness 15 minutes after eating a milk-containing candy (Milk Maid, Brach and Brock Confections). He subsequently had abdominal pain, vomiting, and diarrhea. He became dyspneic and diaphoretic and was transported by his spouse to a nearby hospital emergency department. The patient received diphenhydramine, methylprednisolone, ranitidine, and intravenous fluids. After a few hours he was discharged on a tapering course of oral prednisone.

Eight years ago this patient began working in a research laboratory with Tryptone powder (Difco Laboratory, Detroit, Mich). Tryptone is a casein product that is used in the preparation of culture media. Initially, the patient had no problem; however, during the past few months of working with Tryptone powder, he experienced symptoms of rhinoconjunctivitis. The use of Tryptone capsules instead of noncapsulated powder decreased the frequency and severity of these symptoms. Lately, ingestion of all milk and milk-containing products has caused gastrointestinal and upper respiratory tract symptoms. Until this time, he was able to consume milk and milk products without any untoward reaction. Except for mild allergic rhinitis and sleep apnea, he has no history of food allergy or asthma.

A physical examination at the time of allergy evaluation revealed the patient to be a healthy Asian male without any abnormalities. During the reaction he was diaphoretic and his skin was reportedly mottled with generalized erythema. His vital signs were normal and he had no stridor, wheezing, rhonchi, or crackles.

Prick skin tests were performed in duplicate with use of cow's milk extract (Greer Laboratories, Lenoir, NC) and Tryptone powder (10% wt/vol). The test results were strongly positive with pseudopod-type reactions. Subsequently, prick skin tests were performed with each milk protein—casein extract (Greer Laboratories), lactalbumin, and lactoglobulin powder (Sigma Chemical, St Louis, Mo, 10% wt/vol). The casein skin test was strongly positive with pseudopod-type reactions, whereas the lactalbumin skin test was negative and the lactoglobulin skin test had a mild positive reaction (Table I). All these skin test reagents produced negative reactions on the skin of control nonatopic and atopic but non-food-allergic control subjects. Immunoblot and specific IgE radioallergosorbent tests (Pharmacia-Upjohn CAP System, Kalamazoo, Mich) were negative.

The diagnosis of casein hypersensitivity causing recurrent acute rhinoconjunctivitis, gastrointestinal symptoms, and an acute allergic reaction was established by a clinical history of recurrent symptoms occurring immediately after ingestion or inhalation of milk protein with progressively worsening intensity and ultimately leading to a systemic reaction; strongly positive milk, casein, and Tryptone prick skin tests with pseudopod-type reactions when performed in duplicate; and weakly positive or negative skin prick tests for non-casein milk proteins (lactalbumin and lactoglobulin).

COMMENT

The occurrence of allergic reactions to food in adults is less common than in children. Approximately 2% of

TABLE I. Prick skin test results

Subject	Extract/ control	Wheal (mm)	Erythema (mm)
Patient	Histamine	5	12
	Diluent*	0	0
	Milk	8 (pseudopods)	25
	—Casein	8 (pseudopods)	20
	—Lactalbumin	0	0
	—Lactoglobulin	3	7
Atopic control and nonatopic control	Tryptone	16 (pseudopods)	32
	Milk	0	0
	Casein	0	0
	Lactalbumin	0	0
	Lactoglobulin	0	0
	Tryptone	0	0

Cow's milk and casein extracts from Greer Laboratory, Lenoir, NC, were used undiluted at 600 and 2500 µg/mL, respectively. A 10% extract was prepared from Tryptone powder (Difco Laboratory, Detroit, Mich), lactalbumin, and lactoglobulin powder (Sigma Chemical, St Louis, Mo). All skin prick tests were performed in duplicate.

*Phenol-saline solution-human serum albumin diluent negative control.

adults and 8% of children less than 3 years old have an allergy to a spectrum of foods.^{4,5} This adult male patient had been previously tolerant to milk and milk products. The untoward respiratory and gastrointestinal symptoms that resulted from milk product exposure began after recurrent occupational exposure to Tryptone powder, a casein product. This case illustrates that sensitization to casein milk protein may occur via the respiratory tract in adults who are previously tolerant to milk, similar to psyllium in health care workers.⁶

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