

Contact urticaria to cow milk

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A patient with contact urticaria to cow milk is presented. Contact sensitivity was documented to whole cow milk, skim milk, commercial condensed milk, and milk heated to 80°C for 30 min. Contact sensitivity was also documented to casein and lactalbumin. Unlike a previous report our patient's sensitivity to heated milk precluded its use in the diet. Thus, heating milk does not necessarily reduce allergenicity to its component proteins.

Key words: contact urticaria; cow milk; casein; lactalbumin.

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Cow milk allergy clinically presents, in decreasing order of frequency, as diarrhea, vomiting, abdominal discomfort, atopic dermatitis, rhinitis, asthma, urticaria, and anaphylaxis, with urticaria occurring in only about 13% of sensitive individuals (7). Reviewing the literature reveals contact urticaria to cow milk to be a relatively rare phenomenon. Edwards has reported a case of cow milk inducing contact urticaria (3), but a computer search (Medline) failed to reveal any other cases from 1966 through July, 1985. In a recent review on contact urticaria, Lahti et al. only mention Edward's article in reference to cow milk (6).

We report here a case of a child with atopic dermatitis and asthma who exhibited gastrointestinal and contact hypersensitivity to cow milk.

CASE AND METHODS

The patient is a 3½-year-old boy with a history of asthma and atopic dermatitis. As an infant he would vomit cow milk or milk products within minutes of ingestion. The mother noted no cutaneous reactions. Since infancy milk products have been avoided. However, on two separate occasions the child spilled milk on himself and within minutes developed hives over the areas of contact.

His atopic dermatitis began in infancy while being breast fed but improved when he was weaned to a soy formula. At the time of evaluation his eczema was in remission except for some chronic dryness.

In an effort to find a milk preparation which the child could tolerate, he was closed-patch tested with a variety of commercial products. He was also tested to casein and lactalbumin extracts prepared by Hollister-Stier. A scalded milk was prepared by heating homogenized whole milk at 80°C for 30 min.

Milk samples were applied to the pad of a circular Band-Aid® Sheer Spot. Band-Aids were placed on the volar aspect of the forearms and removed after 20 min. Wheals and flares were circled with a pen and the tracings were transferred to transparent tape and placed on the patient's record.

RESULTS

Fig. 1 demonstrates the wheal and flare response to the various test substances. Unfortunately, the patient reacted to all of the commercial milk products tested and to scalded milk. The reactions to casein and lactalbumin indicate sensitivity to multiple components of cow milk.

Form of Milk	Reaction Size
Condensed	
Powdered (rehydrated)	
Skim	
Whole	
Whole, scalded	
Casein	
Lactalbumin	
Saline	Negative
Band-Aid	Negative

2 centimeters

Fig. 1. Wheals are outlined by solid lines and flares by broken lines. Samples were applied by closed-patch tests and the reactions were read 20 min after application.

Prick tests were performed with 1:20 w/v commercial extracts (Hollister-Stier). Negative reactions were noted to grass mix, ragweed and housedust mite (*D. farinae*). Egg yolk, egg white and peanut were recorded as 4+.

DISCUSSION

Edwards (3) has reported a case of contact urticaria to cow milk in an infant in whom the ingestion of cow milk produced systemic urticaria. Albert & Walzer (1) reported no contact reactions to milk in 21 atopic patients tested, but immediate reactions would not have been detected because the patches remained in place for at least 24 h.

Edwards' patient was able to tolerate heated milk whether applied topically or ingested. Crawford & Grogan (2) reported that heat denaturation of milk reduces the antigenicity of alpha-casein and alpha-lactalbumin, and partially reduces the antigenicity of beta-lactoglobulin. Ratner et al. (8) have shown heat denaturation to reduce the allergenicity in guinea pigs of alpha-lactalbumin but not that of

alpha-casein. Hanson & Mansson (5) have also noted the antigenicity of alpha-casein to be very heat stable (120°C for 15 min), but the antigenicity of the immune globulin fraction was lost at 80°C for 15 min. Unlike the studies of Crawford & Grogan and Ratner et al. alpha-lactalbumin was found to retain its antigenicity. It is apparent that the heat stability of the antigenicity of several milk proteins is variable and probably depends on the stability of the epitope representing the antigen.

Goldman et al. (4) have noted that patients sensitive to cow milk are often sensitive to multiple proteins. Our patient's sensitivity to lactalbumin and casein supports this. The finding in our patient of contact sensitivity to heated milk indicates sensitivity to at least one heat-stable antigen. Identification of the allergen(s) in the heated milk preparation was not attempted. Also not attempted was patch testing to human milk. As noted in the case report the child's eczema improved when he was weaned from breast milk to soy formula. Whether his improvement was coincidental or due to the removal of breast milk from his diet has not been determined.

In conclusion, this case demonstrates contact urticaria to multiple cow milk products and components. Unlike the case presented by Edwards, milk consumption by our subject was prohibited because of heat stability of at least one milk allergen.

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