

stituent of vanilla, is formed from glycosides such as glucovanillyl alcohol and gluconiferyl alcohol. Some individuals are sensitized to synthetic vanillin and not to the natural spice, and vice versa, which might explain why our patient occasionally has ice-cream containing "vanilla" without any trouble.

Contact anaphylaxis due to para-phenylenediamine

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Key words: immediate-type contact allergy; contact urticaria; anaphylactic shock; para-phenylenediamine; Prausnitz-Kustner reaction; hair dye. © Munksgaard, 1996.

Case Report

A 57-year-old woman visited our clinic with a complaint of syncope which occurred within minutes of using a hair dye. She had used the preparation for 8 years without experiencing any problem, but then started to have episodes of itchy bumps on her head and hands 10–30 min after applying the dye, which contained para-phenylenediamine (PPD). The bumps disappeared 3 h later. After her most recent use of the dye, the itchy bumps had spread over her entire body and she had developed nausea, vomiting, and difficulty in breathing, accompanied by a cold sweat. All these symptoms disappeared spontaneously within 3 h. Patch tests with the hair dye and its components (Table 1) disclosed that she had an immediate-type allergy to PPD without any sign of the delayed type.

Having confirmed that she was free from infection, such as HIV, HTLV-1, hepatitis or syphilis, and having obtained the informed consent of her daughter, her serum (0.05 cm³) was injected into her daughter's skin. When PPD was applied to the injected sites the next day, a wheal appeared at the site injected with serum. However, sites injected with heat-treated (100°C for 3

min) serum or normal saline showed no sign of wheals. Therefore, the positive response was confirmed to be a Prausnitz-Kustner (P-K) reaction. 7 other ingredients of the hair dye and procaine hydrochloride failed to produce wheals in either the mother or the daughter (Table 1).

Discussion

To the best of our knowledge, this is the 1st report of immediate-type contact allergy to PPD to appear in a western scientific publication, although 3 similar cases have been reported in Japanese journals (1, 2). Anaphylactic shock appears to be extremely rare, when we consider the annual worldwide consumption of PPD. The reaction described here was confirmed to be transmissible by serum and P-K in type. However, a P-K reaction was not evident in the 3 previous cases.

Although PPD is well-known as being able to cause cross-reactivity to procaine in the case of delayed-type hypersensitivity, the patient fortunately did not exhibit this cross-sensitivity with her immediate-type allergy. We do not know whether there was any cross-sensitivity in the 3 other Japanese cases previously reported.

Table 1. Patch tests in mother and daughter

Test substance	Mother	Daughter		
		serum		normal saline
		intact	heat inactivated	
Immediate-type reaction				
hair dye	+	+	—	—
PPD	+	+	—	—
7 other ingredients of hair dye	—	—	—	—
procaine	—	—	—	—
Delayed-type reaction				
PPD	—	—	—	—

+* a positive test reaction; —** a negative reaction.

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Generalized urticaria induced by a diethyltoluamide-containing insect repellent in a child

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Diethyltoluamide (DEET) is used worldwide in insect repellents. Pure DEET is irritant to skin and mucous membranes. However, the concentrations used in consumer products rarely induce contact dermatitis or urticaria (1-4).

Case Report

A 4-year-old boy was stung by mosquitoes. Shortly afterwards, the insect repellent Anti-Mückenmilch was applied to his legs and forearms. Minutes later, generalized itch and urticaria developed and the boy wheezed and coughed for about 30 min. He was taken to a general practitioner who applied a topical antihistamine. The wheals had gone by the following morning.

Anti-Mückenmilch, Gel tropic version[®] (Jaico, Belgium), was applied as an open patch test. In addition, the boy was prick-tested against Anti-Mückenmilch, mosquito (*Culex pipiens*), histamine 10 HEP and saline solution (negative control). Reading was done after 20 min. Total IgE, specific IgE against mosquito (*Culex*

pipiens) by RAST, and specific IgE against DEET by ELISA were assessed.

A closed patch test against the insect repellent Anti-Mückenmilch, containing 25% DEET, was also performed on the boy's forearm, using Cura Test[®]. In addition, consecutive concentrations of DEET (Sigma Chemicals, St. Louis, USA) in ethanol 35% and another repellent (Autan Lotion[®], Bayer, Germany), containing 20% DEET, were so tested. Substances remained on the skin for 20 min, were then removed, and readings were made after 0, 10, 20 and 50 min.

To exclude irritant effects of the DEET test preparations, a closed patch test was also performed in 10 adult controls.

On open testing, Anti-Mückenmilch did not react. On prick testing, Anti-Mückenmilch and mosquito extract did not react, but a 10-mm diameter wheal to histamine, with 3 satellite wheals, as well as a 2 mm wheal to saline, with a widely spreading erythema, developed. Total IgE was elevated to 70 kU/l (≤ 20 kU/l). Lung function was in the normal range. No specific IgE against DEET or mosquito was found.

Closed patch testing revealed a flat erythematous reaction to Anti-Mückenmilch but no wheal. Concentration-independent flat erythematous reactions were seen to all concentrations of DEET, but also to Autan Lotion[®] as well as to ethanol 35%, persisting for at least 50 min (Table 1). 7/10 controls showed slight erythematous reactions to DEET 25.0% and 20.0% for 5 min.

Discussion

The maximum concentration of DEET in insect repellents is limited to 25%, as higher concentrations may induce irritant skin reactions. In Austria, according to an agreement between all manufacturers, DEET-containing repellents should not be used in children below 6 years of age (5).

In our patient, insect repellents had never been used before. As he showed generalized urticaria and wheezing

Table 1. Skin reaction after 20 min of closed patch testing; no wheals developed

	0 min	10 min	20 min	50 min
Erythema				
Jaico Anti-Mückenmilch [®]	+++	+++	++	+
Autan Lotion [®]	+++	+++	++	+
diethyltoluamide				
25.0%, 12.5%, 6.25%, 3.12%	+++	+++	++	+
20.0%, 10.0%, 5.0%, 2.5%	+++	+++	++	+
ethanol 35.0%	+++	+++	++	+
Cura Test	-	-	-	-
Controls				
diethyltoluamide 25.0%	+ 7/10	-	-	-
diethyltoluamide 20.0%	+ 7/10	-	-	-
ethanol 35.0%	-	-	-	-
Cura Test	-	-	-	-

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