

Short Communications

Allergic contact dermatitis from farnesol in a deodorant

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Key words: allergic contact dermatitis; balsam of Peru; cosmetics; deodorants; farnesol; perfumes; CAS 4602-84-0; bacteriostat. © Munksgaard, 1997.

Case Report

A 30-year-old woman presented with an itchy erythema for 3 weeks in both axillae. This had commenced after application of a deodorant, which she had been using for several weeks at presentation. She was patch tested with the European standard series, the textile dyes para-amino-azobenzene (0.25% pet.), Disperse Orange 3 (1% pet.), Disperse Yellow 3 (1% pet.), Disperse Blue 106 (1% pet.) and Disperse Blue 35 (1% pet.), the deodorant and its ingredients from the manufacturer (not checked for purity). Positive reactions were noted to balsam of Peru (25% pet.) (++ D2), the deodorant (as is), and farnesol (5% eth.) (both + D2, ++ D4). The perfume (5% eth.) in the deodorant was negative. 20 controls tested with the same farnesol dilution were negative.

Discussion

Farnesol is an acyclic primary sesquiterpene alcohol found in essential oils such as lemongrass, citronella, tuberose blossom, sandalwood, and orange blossom. It is used in perfumery to enhance sweet floral perfumes, such as lilac and cyclamen (1), and as a bacteriostat in deodorants at 0.3%, where it inhibits body odor without negatively affecting the skin flora (according to the manufacturer).

Farnesol is also present in balsam of Peru, where it has a weak sensitization potential (2). In practice, contact allergy to farnesol is rarely encountered, and when it does occur, it is generally associated with balsam of Peru. Hjorth (3) reported only 1 positive reaction to farnesol among 230 patients sensitive to balsam of Peru. In our department, farnesol (1% lanolin) was tested in 111 subjects between 1978 and 1987 (along with a Japanese perfume series from Nakayama (4)) to examine its relationship to balsam of Peru. Table 1 gives the results in comparison with those for balsam of Peru, fragrance mix, and other perfume ingredients. Among 8 subjects sensitive to farnesol, 6 also reacted to balsam of Peru. Moreover, several other perfume ingredients were positive.

In the patient reported, the reaction to farnesol could have been either concomitant with or induced via balsam of Peru, but certainly not related to the perfume in the deodorant, since this tested negatively. Hence, the

Table 1. Reactions to farnesol recorded in our department

	1	2	3	4	5	6	7	8
balsam of Peru (25% pet.)	+	+	+	-	-	+	+	+
fragrance mix (16% pet.)	+	+	+	+	+	+	+	NT
fragrance mix (8% pet.)	NT	NT	NT	NT	NT	NT	NT	-
colophony (20% pet.)	+	+	+	+	-	-	-	-
wood tars (12% pet.)	+	+	+	-	+	+	-	NT
Japanese perfume series								
jasmin absolute (10% pet.)	+	+	+	+	+	-	-	NT
camanga oil (15% pet.)	+	+	+	+	-	-	-	NT
ylang ylang oil (5% pet.)	+	+	+	-	-	-	-	NT
lavender oil (20% pet.)	+	+	+	+	-	-	-	NT
geranium oil (20% pet.)	+	+	+	-	-	-	-	NT
geraniol (20% pet.)	+	+	+	-	-	-	-	NT
sandalwood (10% pet.)	+	+	+	+	-	-	-	NT
benzyl salicylate (5% pet.)	-	+	-	-	-	-	-	NT
benzyl alcohol (20% L.)	-	-	+	-	-	-	-	NT
hydroxycitronellal (10% L.)	+	+	+	-	-	-	-	NT
hydroxycitronellal (10% S.)	+	+	-	-	-	-	-	NT
santalol (10% pet.)	+	+	+	+	-	+	-	NT
farnesol (1% lanolin)	+	+	+	+	+	+	+	NT
farnesol (5% eth.)	NT	NT	NT	NT	NT	NT	NT	+
fragrance mix series								
amylcinnamaldehyde (1% pet.)	-	+	-	-	-	-	-	NT
cinnamaldehyde (1% pet.)	+	+	-	-	-	-	-	NT
cinnamic alcohol (1% pet.)	+	+	-	-	+	-	-	NT
hydroxycitronellal (2% pet.)	+	+	-	-	-	-	-	NT
eugenol (2% pet.)	-	+	-	-	-	-	+	NT
geraniol (2% pet.)	+	+	+	-	-	-	-	NT
isoeugenol (2% pet.)	-	+	-	+	-	-	-	NT
oak moss (2% pet.)	-	+	-	-	-	-	-	NT

NT: not tested. +: patch-test positive.

Patient nos. 1 through 7 were tested with the Japanese perfume series.

Patient no. 8: this case report.

contact allergy to farnesol probably accounts for the intolerance to the deodorant.

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Occupational allergic contact urticaria from chloramine-T solution

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Key words: occupational; allergic; contact urticaria; chloramine-T, sodium-p-toluenesulfonchloramide; hospital personnel; prick tests; IgE-mediated. © Munksgaard, 1997.

Case Report

A 48-year-old hospital bath attendant developed itchy hand dermatitis. Half a year later, her dermatitis was accompanied by whealing on the wrists and forearms from spilling of a liquid disinfectant, Klorilli® (Orion-yhtymä Oy, Noiro Erisan-Farmos, Finland). Spillings had caused no skin reactions during the previous 6 months of exposure. She also developed stuffiness of her nose and sneezing when working with Klorilli®. She daily diluted concentrated Klorilli® to a 2% solution before use. She used disposable vinyl gloves and the reaction to Klorilli® appeared only on the unprotected skin of the wrists and forearms. Both concentrated and diluted Klorilli® caused symptoms. The diluted Klorilli® was used to disinfect surfaces in the hospital bathrooms. According to the material safety data sheet, Klorilli® contained 8.5% sodium-p-toluenesulfonchloramine, $\text{CH}_3\text{C}_6\text{H}_4\text{SO}_2\text{NNaCl} \cdot 3\text{H}_2\text{O}$ (CAS 127-65-1), i.e., chloramine-T (Fig. 1). Accordingly, the diluted 2% solution of Klorilli® contained 0.17% of chloramine-T.

Prick testing with standard environmental allergens and flours was negative. Prick tests with chloramine-T conjugated with human serum albumin (HSA) (1) or in aq. gave the following reactions: chloramine-T-HSA 1.5% 15-mm diameter; chloramine-T 1% aq. 9 mm, 0.1% aq. 6 mm, 0.01% aq. 5 mm and 0.001% aq. 2 mm. Histamine hydrochloride 10 mg/ml gave a 6-mm reaction, whereas control tests with the vehicles (HSA and aq.) were negative. A radioallergosorbent test (RAST) to

chloramine-T (Pharmacia & Upjohn, Sweden) was performed 2×; it showed specific IgE antibodies, 9.1 kU/l and 6.4 kU/l, respectively, values >0.3 kU/l being defined as positive. A provocation test with 2% Klorilli® was negative on intact skin but provoked a 4-mm reaction on a skin site that 1 h earlier had been used for prick testing. A provocation test with undiluted Klorilli® containing 8.5% chloramine-T provoked a strong whealing reaction on intact skin. On patch testing, the patient had a +++ reaction to nickel sulfate in the standard series. The antimicrobial series was negative, and chloramine-T was negative in a dilution series (0.5%–0.001% aq.). It was concluded that the patient had developed occupational allergic contact urticaria from chloramine-T.

Discussion

Chloramine (NH_2Cl) and chloramine-T are 2 different chemicals (1, 2). Chloramine is an intermediate product in the manufacture of hydrazine. Chloramine-T (Fig. 1) is a crystalline powder, containing 11.5–13% active chlorine (3). Chloramine-T is commonly used as a sterilizer, antiseptic, disinfectant and chemical reagent. Its use has increased, e.g., in hospitals, because of the increased risk of HIV infection and hepatitis. Klorilli® solution containing 8.5% chloramine-T has recently been vigorously marketed in Finland as a disinfectant for hospital and dental personnel.

Allergic asthma caused by chloramine-T is well-known (1, 4–8) and the reactions are IgE-mediated (5–7), but skin symptoms have only seldom been reported (9–11). Lombardi et al. (11) reported a nurse who was positive on patch testing to chloramine-T (0.05% aq.). Our patient developed symptoms of contact urticaria and rhinitis at about the same time, without having any previous atopic history (12). However, in some cases, contact urticaria precedes allergic rhinitis and asthma (13). 1 previous case of occupational contact urticaria from chloramine-T powder has been published (9). Our patient is the 1st reported case of contact urticaria from chloramine-T solution. 1 case of occupational asthma due to chloramine-T solution was recently reported from Finland (14).

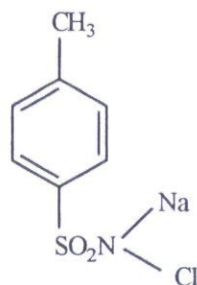


Fig. 1. Chemical structure of chloramine-T (syn. sodium-p-toluenesulfonchloramide, CAS 127-65-1).

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