

10% pet., though normal subjects were negative, suggesting delayed cell-mediated immunity. 10% pet. seems to be preferable, since too high a concentration for patch testing easily elicits false-positive results due to irritancy (3). DMSO is reported to be useful as a vehicle for topical provocation in fixed drug eruption due to some drugs, e.g., sulphamethoxazole and trimethoprim (4). However, allylisopropylacetylurea 10% DMSO in our case showed negative responses to an open patch test on involved skin or a closed test on unaffected skin.

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Contact dermatitis in children

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Key words: allergic contact dermatitis; children; nickel; chromate; fragrance; neomycin; rubber. © Munksgaard, 1996.

During 1970-1994, we patch tested 626 children (353 girls and 273 boys) aged 3 to 16 years, 349 of whom (189 girls and 160 boys) were aged 14 years or less. Part of this material has already been published (1). Positive reactions were obtained in 42.70% (29.67% boys and 51.84% girls) and this difference was statistically significant at $p < 0.05$. As in previous reports, the frequency of contact sensitivity increased with increasing age. Our youngest patient with contact dermatitis was a 6-year-old boy positive to chromium. The frequency of sensitivity to various allergens is shown in Table 1.

Comment

We stress the following.

(a) *Nickel*. A statistically significant difference was found in the frequency of nickel sensitivity between boys (5.49%) and girls (15.30%), but only after the age of 12 years, as observed by others (2-4). Such a difference has also been reported at a younger age (5).

(b) *Chromium*. A 15-year-old boy positive to chromium, at a vocational school for locksmiths, had occupational dermatitis. Occupational dermatitis has been observed previously in children as young as 13-14 years (5).

(c) *Fragrance mix*. Contact sensitivity to fragrance mix began at the age of 9 years, and then increased, especially in girls after the age of 12 years, though not with a statistically significant difference between girls and boys. We also tested with a mixture of cassia and citronella oils (6), to which only girls were positive (2.27%).

(d) *Neomycin*. This antibiotic caused sensitivity most frequently in children aged 9-10 years (13.79%), in which age group neomycin was 2× as frequent as nickel.

Table 1. Positive patch tests in children

Age range (years)	3-14 (n=349)	3-16 (n=626)
Allergens	(%)	(%)
nickel sulfate	8.02	11.02
potassium dichromate	4.87	5.43
cobalt chloride	4.87	4.79
mercuric chloride	2.58	3.04
fragrance mix	3.15	3.04
PPD	1.15	3.04
neomycin	2.87	2.40
balsam of Peru	2.87	2.24
mix of cassia and citronella oils	1.15	1.28
turpentine	0.29	1.28
propolis	0.29	1.28
IPPD	0.86	0.96
mercaptobenzothiazole	0.86	0.96
benzocaine	0.57	0.80
colophony	0.86	0.64

(e) *Rubber accelerators*. 6 patients (0.96%) were positive to MBT but none to TMTD. A greater frequency of sensitivity to MBT than to thiuram has also been observed by other authors (4, 7), though not all (2).

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Offset printer's occupational allergic contact dermatitis caused by cobalt-2-ethylhexoate

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Key words: cobalt-2-ethylhexoate; cobalt octoate; CAS 136-52-7; offset printer; occupational; ink; drier. © Munksgaard, 1996.

Cobalt salts are well-known sensitizers (1): used as driers in paints or inks, they have, on rare occasions, been reported as occupational allergens (2, 3).

Case Report

A non-atopic male, born in 1943, had worked as an offset printer since 1960, and had for a long time had hand eczema. He was first investigated by us in 1983: bacitracin elicited an allergic patch test reaction, otherwise the standard series, rubber chemical series and plastics and glues series were negative. In 1995, his hand dermatitis deteriorated, and he was referred back to us for further investigation. Cobalt chloride gave an allergic patch test reaction in the standard series, and in a dilution series, 3.2% chloride gave a ++ reaction, 1-0.32% a + reaction, and 0.1% was negative. 2 of the ink driers from work provoked allergic patch test reactions when tested in dilution series (1 to 10% pet.). The material safety data sheets of the driers declared them to contain 5% and 2% cobalt-2-ethylhexoate (4), respectively. The manufacturer confirmed that the driers contained 5% cobalt-2-ethylhexoate in mineral oil, and 2% cobalt-2-ethylhexoate plus 4% manganese octoate in mineral oil, respectively. Nickel sulfate was negative on patch testing.

Discussion

Isolated cobalt allergy is relatively rare (5). Our patient had been in contact with cobalt-2-ethylhexoate (syn. cobalt octoate, $C_4H_9CH(C_2H_5)COOH$, CAS 136-52-7), the cobaltous salt of 2-ethylhexoic acid, used as a paint and ink drier, whitener and catalyst (4). Cobalt has long been recognized as a contact sensitizer in painters. Pirilä (2) reported dermatitis from a cobalt drier in a paint factory worker. Burrows & Adams (1) mention the fol-

lowing cobalt salts as driers of paints and varnishes: the ethylhexoate, abietate, acetate, hydroxide, linoleate, naphthenate, oleate, tallate and tungstate.

Paint films are formed by the drying of various unsaturated oils, such as linseed, soyabean, fatty acid, tall, tung, safflower, fish and marine, coconut and oiticica oils (6). Drying represents oxidation and polymerization, and is hastened by pretreatment of the oil and by adding driers, or catalysts, predominantly heavy-metallic soaps, which are oxygen carriers, usually soluble in oil (6). Driers include cobalt, manganese, lead, zinc, calcium, barium, zirconium and tin naphthenates, resins, linoleates, 2-ethylhexoates and tallates (6, 7), paints often containing more than one. Driers, especially cobalt naphthenate and oleate, may sensitize (1, 3, 7). Recently, we reported a laminator in boat building, who contracted cobalt allergy from 10% cobalt naphthenate (8). Cobalt-2-ethylhexoate seems not previously to have been reported as a sensitizer. Dermatitis patients in contact with inks, paints or varnishes need to be patch tested with cobalt, which is no problem because cobalt chloride is included in the standard series, though its potential relevance in such patients may well be missed.

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