

Active sensitization to (meth)acrylates

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Key words: active sensitization; (meth)acrylates; patch testing technique. © Munksgaard, 1998.

Patch testing with (meth)acrylates runs risks of irritation and active sensitization at higher concentrations, and false-negative results at lower (1–3).

Case Report

A 62-year-old woman presented with a 4-year history of palatal lesions related to the wearing of a plastic dental prosthesis. Examination revealed erythema and slight erosions of the palate. Patch testing with the GEIDC standard series and additional series of plastics and glues, rubber chemicals and (meth)acrylates (Chemotechnique) were negative after 2 and 4 days.

3 weeks later, she re-attended because of some discomfort in the test area. Examination confirmed that

there were erythematous areas on her back, corresponding to the area of application of the (meth)acrylates series. Repatch testing with the (meth)acrylates series gave the reactions shown in Table 1.

Discussion

We presume that our patient's presenting symptoms were irritant, rather than allergic, and that she was actively sensitized by patch testing with (meth)acrylates. Both Cavalier et al. (2, 3) and Kanerva et al. (1) have published previous cases, which have become rarer since patch test concentrations were reduced.

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Table 1. Repatch test results

Allergen	(%)	Vehicle	D4
butyl acrylate	0.1	pet.	+++
ethyl acrylate	0.1	pet.	+++
2-hydroxyethyl methacrylate	2	pet.	+++
methyl methacrylate	2	pet.	+++
ethyleneglycol dimethacrylate	2	pet.	+
triethyleneglycol dimethacrylate	2	pet.	+

Textile dye contact dermatitis in an allergic population

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Key words: allergic contact dermatitis; dyes; clothing; textiles; patch testing technique; Disperse Blue 124; disperse mix. © Munksgaard, 1998.

We have reviewed 1012 patients (311 men and 701 women) with suspected allergic contact dermatitis, who were patch tested with the GIRDCA standard series, augmented by a disperse mix and 2 dark dyes (Disperse Black 1 1% pet. and Disperse Blue 3 1% pet.), these 2 latter being selected as frequently responsible for sensitization in Italy (1). In cases with a positive history of wearing coloured garments, we also performed patch tests with pieces of suspected fabrics.

Of the 1012 patients, 31 (26 women and 5 men) reacted positively to textile dyes. Our main finding was that only 2 subjects out of 31 had occupational contact with fabrics (a fabric salesman and an employee in a

dry-cleaners), whereas other data indicate that most such sensitization is to be found in textile and manufacturing industry workers (2). Only 10 patients out of 31 gave a clear history of intolerance to dyed garments. We found no cases of sensitization from socks or stockings, while these are frequently mentioned as sources in the literature (2). The clothes responsible for sensitization were underwear, trousers, linings (2 cases each), shirts, tracksuits, shoulder-straps and a dyed bracelet (1 case each). The neck was most often involved (7 patients out of 31), followed by the hands and thighs (6 patients), and eyelids (5 patients) (2–4).

Disperse Blue 124 was most often positive (22 cases

out of 31 patients, 71%), followed by Disperse Yellow 3 (8 cases, 26%) and Disperse Red 1 (5 cases, 16%). Disperse mix (Disperse Blue 124 1%, Disperse Red 1 0.25%, Disperse Orange 3 0.25%, Disperse Yellow 3 0.5%) gave 26 positives out of 31 patients (84%), confirming most of the positivities to 1 of the GIRDCA standard series dyes, and confirming its status as a useful indicator of dye allergy. 5 patients out of 10 tested with pieces of their clothes had positive patch test reactions: 3 also reacted to GIRDCA standard series dyes while 2 were positive only to their own fabric. Clothes giving positive patch test reactions were mainly dark materials (wool-synthetic mix) and linings.

Skin allergy from exposure to alloys of chromium

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It is well-known that hexavalent chromium (Cr(VI)) ions in the form of soluble chromates are potent sensitizers, whereas trivalent chromium (Cr(III)) ions have only a weak propensity to sensitize (1). Indeed, practical treatments for eliminating or reducing risk from industrial exposure to hexavalent chromium often involve its reduction to the trivalent form (2).

Chromium-containing alloys, especially stainless steels, are extensively handled in both domestic and industrial usage under conditions that may involve prolonged contact with the skin. Examples are contact with jewellery, knitting needles, cutlery and tools, and in specialist applications such as surgical skin-clips and dental braces. The term 'stainless steel' loosely covers a wide range of iron-based alloys containing more than about 10% chromium. These alloys may possess greatly differing properties. The most commonly occurring stainless steel, containing 18% Cr and 9% Ni, does not react with sweat under normal circumstances. Consequently, it gives negative patch test results and shows no chromium or nickel release when exposed to artificial sweat (3). However, under adverse circumstances of long periods of exposure in tight crevice conditions as, for example, with a tightly bound watchstrap worn continuously, 'stainless' chromium-containing alloys may react with sweat (4). Moreover, the surface oxide film that protects the 'stainless' chromium-containing, iron- and nickel-based alloys from corrosion is less protective if the alloy is low in chromium content or rich in sulfur (5, 6). The film may then break down or be penetrated, especially by chloride ions, and, as a consequence, release chromium and/or nickel ions. Thus, it is important to establish whether, in these adverse circumstances, chromium-containing alloys are able to form hexavalent chromium ions.

Accordingly, specimens of chromium-containing alloys that could be expected to undergo corrosion in arti-

ficial sweat and saline solutions were selected for test (Table 1). These were an experimental, low-chromium stainless steel (A); a nickel/chromium alloy (B); and a 12Cr/12Ni steel (C), a composition which has been used for watch cases. Specimens were immersed in an artificial sweat solution (Table 2) or a 0.9% saline solution, under test conditions similar to those described in the draft European standard, prEN 1811. The amount of Cr(III)- and Cr(VI)-release was determined by flow injection analysis – inductively coupled plasma mass spectrometry (FIA – ICP-MS), based on the method described by Cox et al. (7). In essence, Cr(III) is separated from Cr(VI) on a micro-column of activated alumina and sequentially determined in the ICP-MS by monitoring the ⁵²Cr isotope. The method is capable of detecting 10 ng/g of Cr(VI) in the presence of 500 ng/g of Cr(III), with >95% recovery of Cr(VI). In this case, the detection

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Table 1. Compositions of test alloys (%)

Test alloy	C	Si	S	Cr	Ni	Mo	Fe	Mn
A	0.02	0.75	0.005	11.7	1.3	0.14	bal	–
B	–	–	–	15	bal	–	7	–
C	0.04	0.45	0.022	12.5	12.2	0.28	bal	0.7

Table 2. Composition of artificial sweat

The solution representing artificial sweat consists of deionized and aerated water containing:
0.5% (m/m) sodium chloride;
0.1% (m/m) lactic acid;
0.1% (m/m) urea;
ammonia solution, 1%, to pH 6.5