

Allergic contact dermatitis caused by benzophenone-4 in a printer

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Benzophenones are organic compounds that are widely used as chemical ultraviolet (UV) filters, fragrance enhancers, and photo-initiators (1). Benzophenone-4 (2-hydroxy-4-methoxy benzophenone-5-sulfonic acid, sulisobenzene, CAS 4065-45-6) is widely used in sunscreens. It is also present in toiletries and cosmetics to retard photodegradation and extend shelf life. Benzophenone-4 was the most frequent patch test-positive photochemical in one series of patients with suspected cosmetic and/or facial problems (2). We present an unusual case of occupational allergic contact dermatitis caused by benzophenone-4 in a printer.

Case Report

A 19-year-old printer developed facial erythema at the end of a working day in January, following a one-off

utilization of inks that she did not normally use (see Fig. 1). The facial erythema evolved over the subsequent days, with scale and severe pruritus. There was no angioedema or respiratory compromise. She had a previous history of mild atopic eczema, but no history of sunscreen problems.

Patch testing was performed with the British Contact Dermatitis Society baseline and cosmetic series, photopatch series and (meth)acrylate series. Benzophenone-4 (10% pet.) gave positive reactions (D2+ and D4++) on both covered and irradiated (UVA 5 J/cm²) sites. The dye used was Fototex lacquer (UV matt), which, according to the manufacturer's data sheet, contained 32–55% benzophenone. The patient's normal printing lacquers did not contain this chemical, and we could not find this sunscreen in any of the topical products that she had applied during this time. It was not clear whether she was sensitized from previous use of sunscreens or topical products or from previous exposure to this lacquer. A diagnosis of allergic contact dermatitis caused by benzophenone-4-containing lacquer was made. She has since left her job as a printer.

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Fig. 1. The benzophenone-containing inks were used in this printer.

Discussion

Benzophenones absorb light throughout the UVB spectrum and part of the UVA and UVC spectrum (3), which

slows photodegradation of colour in paint. This case highlights the fact that benzophenones are used in products other than sunscreens and cosmetics. A study investigating photo-patch testing in patients with photo-aggravated dermatitis found that benzophenones were the commonest UV filters associated with a positive result, which was observed in 12.0% of all patients tested and 27.8% of reactive patients (4).

Results from EPI-DERM, a UK-based voluntary surveillance scheme for occupational skin disease, has indicated an estimated rate of 7.5 dermatitis cases per 10 000 in print workers in 1995, with common precipitants including alcohols and waxes, and contact allergens such as potassium dichromate (5). A study performed by Livesley et al., among workers in the printing sector, found that the overall prevalence of dermatitis ranged from 48% to 52%, with an incidence of 26%. Among those with a skin problem, occupational-related irritant contact dermatitis was the commonest diagnosis, being present in 44% (6).

This is an unusual case of allergic contact dermatitis caused by benzophenone-4 as a component of a printing dye. The importance of this as an occupational risk should be considered.

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