

Contact allergy from a biocide in multi-surface detergent wipes – a potentially overlooked source

Contact Dermatitis 2009; 60: 230–231

E. A. Langan¹, R. C. Brooke² and M. Beck³

¹Dermatological Sciences, University of Manchester, ²Contact Dermatitis Investigation Unit (CDIU) and ³The Dermatology Centre, Salford Royal NHS Foundation Trust, Salford M6 8HD, UK

Key words: 4,4-dimethyl oxazolidine; biocides; multi-surface wipes; occupational.

Case Report

A 27-year-old atopic nurse presented to us with a 5-year history of hand eczema that developed 1 year after she began working as a ward nurse. At work, she frequently used multi-surface detergent wipes (Sani-cloth[®], PDI, Aber park, Cheshire, UK) to clean clinical areas, surfaces, and mattresses. On examination, she had eczema affecting both the palms and the ventral aspects of her fingers reaching her fingertips.

The patient was tested to the British Contact Dermatitis Society baseline series allergens from Trolab Allergens (Almival Hermal GmbH, Reinbeck, Germany) and Chemotechnique Diagnostics, Vellinge, Sweden; in Finn Chambers[®] (Biodiagnostics, Worcestershire, UK) on Scanpor[®] (Biodiagnostics, Worcestershire, UK) tape with 2D occlusion and International Contact Dermatitis Research Group criteria used for readings). A local fingertip series, cetrimide, chlorhexidine, and her own treatments and cleansers, including alcohol gel used at work, were also applied. It was noted on the product label that the multi-surface wipes she used at work contained the biocide 4,4-dimethyl oxazolidine (CAS 51200-87-4). In view of this, we patch tested her to Bioban[®] CS 1135 (Chemotechnique diagnostics, Vellinge, Sweden), which contains 74.7% 4,4-dimethyl oxazolidine (Chemotechnique Diagnostics, Vellinge, Sweden), as 4,4-dimethyl oxazolidine could not be obtained separately for testing. We also tested the patient to methylene-bis(methyloxazolidine) (CAS 66204-44-2) (Trolab[®] Almirall Hermal

Table 1. Results of patch testing

Allergen, dilution, vehicle	D2 reading	D4 reading
Bioban [®] CS 1135, 1% pet.	+	++
2-Bromo-2-nitropropane-1,3 diol, 0.25% pet.	+	++
Diazolidinyl urea, 2% pet.	+/-	+
Formaldehyde, 1% aqueous	+	++
Methylene-bis(methyloxazolidine), 1% pet.	+/-	++
Quaternium-15, 1% pet.	++	++
Tosylamide/formaldehyde resin, 10% pet.	-	+

GmbH, Reinbeck, Germany), given that it has a similar chemical structure to 4,4-dimethyl oxazolidine, in addition to also being a formaldehyde-releasing biocide. Results are presented in Table 1.

Discussion

Bioban CS 1135 is a broad-spectrum biocide, based on 4,4-dimethyl oxazolidine chemistry (1). It is used in the metalwork industry as a preservative for metalwork fluids (2) and is a potential contact allergen (3). Its low molecular weight allows cutaneous penetration and interaction with endogenous proteins, which may facilitate its allergenic potential. Chemotechnique state that their Bioban CS 1135 patch test allergen contains 74.7% 4,4-dimethyl oxazolidine with 3,4,4-trimethyl oxazolidine (CAS 75673-43-7).

In common with many biocides, 4,4-dimethyl oxazolidine is a formaldehyde releaser (1). As our patient is also allergic to formaldehyde and simultaneously to several other formaldehyde releasers, we cannot say with certainty whether her contact allergy was primarily from formaldehyde or associated with a concomitant allergy. Indeed, sensitization from biocides, including methylene-bis(methyloxazolidine), independent of formaldehyde, has been reported (2). We believe that the findings are relevant to her dermatitis but cannot rule out an associated element of irritant contact dermatitis.

Allergic contact dermatitis secondary to preservatives in facial wipes and moist toilet tissue is well recognized (4, 5) but is not well described from multi-surface detergent wipes. Such wipes are now very widely used in hospital environments to wipe down surfaces, bedding, chairs, etc., and hand contact by hospital staff may be frequent and repeated throughout the day. Importantly,

the biocides used in them may not be routinely screened for. Given both the prevalence of contact dermatitis in health-care workers and the widespread use of multi-surface detergent wipes, it is vital that anyone with hand dermatitis is questioned on the use of such wipes. Furthermore, the components of the wipes must be sought, and allergenic components must be patch tested.

References

1. Yamano T, Shimizu M, Tsutomu N. Allergenicity evaluation of Bioban CS-1135 in experimental animals. *Contact Dermatitis* 2004; 50: 339–343.
2. Madan V, Beck M H. Occupational allergic contact dermatitis from N, N-methylene-bis-5-methyl-oxazolidine in coolant oils. *Contact Dermatitis* 2006; 55: 39–41.
3. Geier J, Lessmann H, Hellriegel S et al. Positive patch test reactions to formaldehyde releasers indicating contact allergy to formaldehyde. *Contact Dermatitis* 2008; 58: 175–177.
4. Natkunarajah J, Osborne V, Holden C. Allergic contact dermatitis to iodo-propynyl butylcarbamate found in a cosmetic cleansing wipe. *Contact Dermatitis* 2008; 58: 316–317.
5. Timmermans A, De Hertog S, Krzysztofa G et al. "Dermatologically tested" baby toilet tissues: a cause of allergic contact dermatitis in adults. *Contact Dermatitis* 2007; 57: 97–99.

Address:
 Dr Ewan Langan
 Department of Dermatology
 Salford Royal Foundation Trust
 Stott Lane
 Salford M6 8HD
 UK
 Tel: +00 44 161 206 1014
 Fax: +00 44 161 206 1998
 e-mail: ewan.langan@postgrad.
 manchester.ac.uk; ealangan@fsmail.net