

Occupational allergic contact dermatitis caused by *N*-(3-aminopropyl)-*N*-dodecylpropane-1,3-diamine in a surface disinfectant

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A 24-year-old woman developed hand eczema after 6 months of full-time cleaning of hospital operating theatres, using a surface disinfectant (Microbac® forte). The skin lesions healed during sick leave and application of topical corticosteroids, but recurred after she had returned to work, and then spread to the face. She was finally dismissed after 12 months, and her dermatitis cleared. She suffered from hay fever for years, but had never had any skin problems.

She was patch tested with the base-line series, a series of disinfectants (including benzalkonium chloride), and fragrances, as recommended by the German Contact Dermatitis Group. Microbac forte 0.4% and 0.04% aq.



Fig. 1. Patch test reactions to *N*-(3-aminopropyl)-*N*-dodecylpropane-1,3-diamine 0.1% aq. (above) and Microbac® forte 0.4% aq. (below) at D3.

Table 1. Positive patch test results

Patch tests	Readings	
	D2	D3
Microbac® forte 0.4% aq.	?	+
<i>N</i> -(3-aminopropyl)- <i>N</i> -dodecylpropane-1,3-diamine 0.1% aq.	+	+
Glutaraldehyde 0.3% pet.	+	+
2-Phenoxyethanol 1.0% pet.	–	+
Myroxylon pereirae 25% pet.	+	+
Sandalwood oil 10% pet.	+	+

and its constituent *N*-(3-aminopropyl)-*N*-dodecylpropane-1,3-diamine 0.1% and 0.01% aq. (and further ingredients) were patch tested as recommended by the German Occupational Contact Allergy Network (KAB-Netzwerk). Readings showed positive reactions to Microbac forte 0.4%, *N*-(3-aminopropyl)-*N*-dodecylpropane-1, 3-diamine 0.1% (Fig. 1), glutaraldehyde 0.3%, phenoxyethanol 1.0%, myroxylon pereirae 25%, and sandalwood oil 10% (Table 1). Two controls were negative to *N*-(3-aminopropyl)-*N*-dodecylpropane-1,3-diamine 0.1% and 0.01%.

Discussion

Hospital staff are at risk of being sensitized to surface and instrumental disinfectants (1). *N*-(3-aminopropyl)-*N*-dodecylpropane-1,3-diamine [CAS No. 2372-82-9, EINECS

No. 269-919-4, syn.: Lonzabac®-12, bis(aminopropyl)laurylamine, laurylamine di-propylenediamine] is a typical constituent of disinfectants based on quarternary ammonium compounds. It has only rarely been recognized as a contact allergen (2, 3). The chemical is classified as non-sensitizing according to the safety data sheet.

Similar to the three published cases on hospital employees, our patient developed facial eczema caused by disinfectant vapours (2, 3). Our case was further complicated by additional sensitization to the biocide glutaraldehyde, which is a well-known occupational contact allergen in disinfectants (4). The remaining sensitizations were not related to occupational exposure and were not considered to be clinically relevant.

In conclusion, disinfectants based on quarternary ammonium compounds

should be considered as possible, although uncommon, causes of contact allergy in hospital employees.

Conflicts of interest: We declare that we do not have any conflicts of interest.

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