

Severe allergic contact dermatitis caused by a rubber glove coated with a moisturizer

Katrien Vanden Broecke¹, Erik Zimerson², Magnus Bruze² and An Goossens¹

¹Department of Dermatology, Katholieke Universiteit Leuven, B-3000 Leuven, Belgium and ²Department of Occupational and Environmental Dermatology, Skåne University Hospital, Lund University, S-205 02 Malmö, Sweden

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Case Report

A 65-year-old non-atopic man presented in 1 July 2012 to the emergency department of our hospital with a well-demarcated severe oedematous and vesicular reaction on the back of his right hand, extending to his wrist and forearm (Fig. 1); on the back of his left hand, he showed only a very discrete papulovesicular itching reaction. Three days previously, he had cleaned his garden shed with ammonia diluted in water by use of a sponge, thereby wearing a rubber glove on his right hand only (Vileda Comfort and Care, Comfort plus, extra-absorbent®; Vileda, Verviers, Belgium), the interior side being coated with a moisturizer, said to contain perfume and chamomile. With the left (ungloved) hand, he had occasionally held the wet sponge. He had noticed that some of the ammonia solution had spilled into the glove, but he had continued cleaning for ~2 hr without taking it off, without any discomfort. It was only on the next day that the itching, redness and swelling started to develop. The lesions had become really severe, despite using a corticosteroid cream (Fucicort®; Leo, Wilrijk, Belgium). At the emergency unit, the patient received treatment with oral steroids, application of a wet dressing for 15 min twice daily, Diprosone® cream (Schering-Plough, Heist-op-den-Berg, Belgium), and systemic antihistamines and ibuprofen; this was followed by gradual improvement of the skin lesions after 2 weeks; the treatment was further reduced, and a moisturizer was prescribed. However, the patient was seen by us in October, and mentioned that he had stopped using



Fig. 1. Severe dermatitis on the right hand and wrist in contact with the rubber glove.

the moisturizer, as it had again produced worsening of his skin lesions.

The patient had been patch tested in 2009, and had been shown to be allergic to cetrimide, (a quaternary ammonium compound), isopropanol, iodine, and povidone iodine, which had been considered to be relevant to skin lesions that he had developed during wound treatment of his left elbow following osteosynthesis. The dermatitis had been treated with Fucicort® cream. Later on, he had experienced a skin reaction on his knee following the application of an ointment, the name of which he could not recall.

As a retired endive farmer, he had been wearing rubber gloves for > 20 years without any skin problems.

Materials and methods

Patch testing was performed with the European baseline series (Trolab, Hermal, Reinbek, Germany), a rubber series, chamomile – because it was present in

Correspondence: Professor An Goossens, Department of Dermatology (Contact Allergy Unit), University Hospital St Rafaël, Katholieke Universiteit Leuven, Kapucijnenvoer 33, B-3000 Leuven, Belgium. Tel: +32 16 33 78 60; Fax: +32 16 33 70 12. E-mail: an.goossens@uzleuven.be

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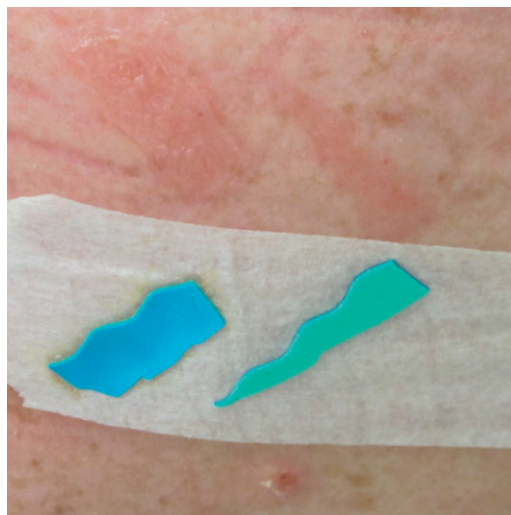


Fig. 2. Strong positive reactions to both the interior and exterior sides of the glove.

the gloves (Chemotechnique, Veilinge, Sweden) – and the ingredients of the topical creams used. Van der Bend® patch test chambers (van der Bend, Brielle, The Netherlands) were applied on Micropore® (3M Health Care, Borken, Germany), and fixed with Mefix® (Mölnlycke Health Care, Göteborg, Sweden). We also performed a test with pieces of both the interior and exterior sides of the Vileda® glove fixed on Micropore® tape. The readings were performed on D2 and D4 according to the guidelines of the International Contact Dermatitis Research Group. On D2, the patient showed very strong oedematous and vesicular reactions to both the interior and the exterior side of the Vileda® glove (Fig. 2). The only other positive test reaction that we observed was to cetyl alcohol (Fig. 3), which was found

to be present in both the corticosteroid creams and the moisturizing cream that the patient had used to treat his dermatitis.

Chemical analysis

As the company did not provide information on the glove composition, in order to identify the ingredients present in the gloves, one glove was extracted on the inside with 25 ml of ethyl acetate of AnalR Normapur quality (VWR International S.A.S., Fontenay-sous-Bois, France) for 15 seconds. This extract was evaporated under vacuum (30°C) to a final volume of 5 ml, filtered, and analysed with gas chromatography–mass spectrometry at the Department of Occupational and Environmental Dermatology, Malmö University Hospital, Sweden. The details of this analysis are given elsewhere (1). The identification of substances in the extract was performed by searching similar mass spectra in the NIST database.

The analysis showed the presence of different fatty alcohols, with C12, C18 and C20 carbon chains (cetyl alcohol or hexadecanol, C16, itself could not be detected), as well as dodecyltrimethylammonium chloride, a quaternary ammonium compound that is closely related to cetrimide.

Thereupon, additional patch testing with the ingredients from the Vileda® gloves were performed, and showed strong positive reactions to stearyl alcohol (C18) and behenyl alcohol [which includes lauryl (C12), myristyl (C14), cetyl or palmityl (C16), stearyl (C18), oleyl (C18, unsaturated) and linoleyl (C18, polyunsaturated) alcohols] (Fig. 3). Additionally, contact allergy to benzalkonium chloride (alkyldimethylbenzylammonium chloride), another quaternary ammonium compound, was detected. Unfortunately, we were unable to test with dodecyltrimethylammonium chloride, which was identified in the glove, as it was not available.

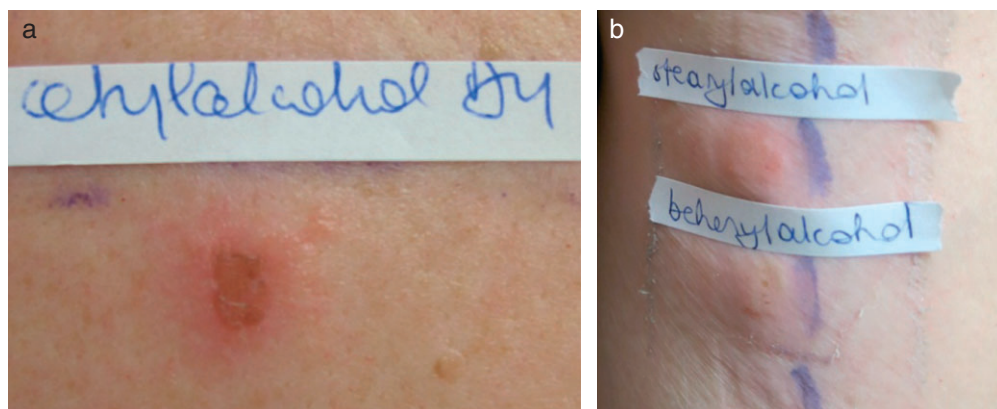


Fig. 3. Strong positive reactions to the fatty alcohols cetyl alcohol (a), stearyl alcohol, and behenyl alcohol (b).

Discussion

We describe here a patient who presented with severe allergic contact dermatitis after wearing gloves coated with a moisturizer that the company claims “diminishes the risk for allergies”. However, we detected contact allergy to fatty alcohols, that is, cetyl alcohol, stearyl alcohol, and behenyl alcohol, which are widely used in cosmetic and pharmaceutical ingredients with emollient, emulsifying, emulsion-stabilizing, foam-boosting, masking, opacifying, refatting, surfactant, viscosity-controlling and binding properties (2), as well as to quaternary ammonium compounds, both of which were present in the gloves.

The dermatitis appeared on the day after the exposure, which partly argues against a toxic reaction from

ammonia. Moreover, the morphology of the reaction was consistent with an allergic reaction, the severity of which might have been attributable to the dissolution of the different components of the gloves by the ammonia solution.

As the eczematous reaction had already started after 1 day, the patient must have been sensitized prior to the glove exposure: the patient was known to be allergic to cetrimide (cetyltrimethylammonium bromide or hexadecyltrimethylammonium bromide), which is closely related to the quaternary ammonium compound identified in the glove; cetyl alcohol had not been previously patch tested, but was present in the Fucicort® and perhaps also in the unidentified cream that had previously caused a reaction on his knee.

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