

Contact allergy to diglycolamine in a water-based metalworking fluid

Johannes Geier¹, Holger Lessmann¹,
Andrea Graefe² and Thomas Fuchs²

¹Information Network of Departments of Dermatology (IVDK), Georg August University, Department of Dermatology, Göttingen, Germany

²Georg August University, Department of Dermatology, Allergy Unit, Göttingen, Germany

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Case report

A 39-year-old metalworker with no history of atopy had had a work-related hand dermatitis for 5 months. In the beginning, his skin complaints diminished when he was 1 week on sick-leave, followed by a relapse after re-starting work. Within 3 months, the dermatitis had spread from the hands to the arms, and eventually became widespread. His dermatitis was treated, and he stopped working for 4 weeks. After this time, the lesions had cleared almost completely. He re-started his work, and within 2 weeks, his hand dermatitis relapsed.

The patient had worked in the metal industry in Kazakhstan since 1981. There, he had mostly skin contact with drilling and cutting oils and some contact with water-based metalworking fluids (MWF). He came to Germany in 1999 and started to work in a small metalworking company in November 2000. At this workplace, he had extensive skin contact with a water-based MWF when working with a CNC turning and milling machine.

The patient was patch tested with the German standard series, indus-

trial biocides, metalworker series, and ointment base series as recommended by the German Contact Dermatitis Research Group (DKG) (<http://www.ivdk.gwdg.de/dkg/dkgblo.html>). In addition, clinic-specific extensions to the standard and preservatives series and additional constituents of MWF were tested. The latter were (i) commercially available allergens covering the known spectrum of contact allergens in MWF in Germany (1), and (ii) a series of MWF compounds prepared from raw materials used in the production of MWF, being tested as a study in five departments of dermatology of the Information Network of Departments of Dermatology (IVDK). (Results obtained with this test series will be published in detail separately.) Patch tests were performed and read according to the DKG guidelines (2).

The only positive test reaction was to diglycolamine (syn. 2-(2-aminoethoxy)ethanol, CAS-No. 929-06-6; Fig. 1), which elicited erythema, infiltration and vesicles at D3 (Table 1). Further investigation revealed that diglycolamine was present in the stock solution of the MWF from the patient's workplace at a concentration of 10%. Unfortunately, the patient was unable to bring a sample of the MWF from his workplace for patch testing. Prick tests for atopy screening remained negative except for a weak reaction to cat allergen, which was without clinical relevance.

Comment

Diglycolamine is used in MWF as an emulsifying agent. Its acute toxicity is low and, undiluted, it has corrosive effects on the skin and eyes of rabbits. Diglycolamine showed no clear-cut sensitizing effect in a Buehler test in guinea pigs (3). In the literature, we could not find any report of a contact allergy to diglycolamine in humans.

Eighty other metal workers (71 males, 9 females) had been tested with diglycolamine 1% petrolatum in the course of the above-mentioned

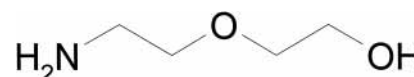


Fig. 1. Chemical structure of diglycolamine (CAS-No. 929-06-6).

Table 1. Test reaction to diglycolamine 1% pet. (Patch test exposure time: 2D)

D2	D3	D4
+	++	+

study up to that time. Of these, 79 showed negative reactions at D3, and in one case, a questionable reaction with a few follicular papules occurred. Against the background of these control tests, the positive reaction observed in our case is obviously a true allergic reaction. The presence of this chemical in the MWF from the patient's workplace and the work-related course of the disease clearly demonstrate the clinical relevance of the positive patch test reaction in this case. The patient's employer was advised to change to an MWF without diglycolamine.

References

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Address:

Johannes Geier, MD
IVDK an der Universitäts-Hautklinik
von-Siebold-Str. 3
37075 Göttingen
Germany