

Allergic contact dermatitis as a result of diethylthiourea

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Elisabeth B. M. Kroft and Pieter G. M. van der Valk

Department of Dermatology, Radboud University Nijmegen, Medical Centre, PO Box 9101, NL-6500 HB Nijmegen, The Netherlands

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Thiourea compounds are mainly used as accelerators in the rubber industry. They are also used in the production of neoprene. The below case study shows an example of dermatitis as a result of an allergic reaction to diethylthiourea from a semi-drysuit.

Case Report

A 38-year-old, non-atopic male patient presented himself with dermatitis over his whole body, except the face, hands, and feet. In particular, the lesions were present in the axillary folds and groin area.

The skin lesions started following diving with a newly bought neoprene semi-dry diving suit 1.5 years ago. The itching and swelling were prevalent in places where the diving suit was particularly tight against his skin. He did not have any skin complaints as a result of contact within water without the suit. The patient's medical history did not show any allergic contact reactions, in particularly not to rubber. Furthermore, he did not use

any topicals and/or disinfectants or cleaning materials for his diving suit.

Patch testing with the European Standard series and the rubber series and material from his diver showed ++ reactions to diethylthiourea and to material of the suit.

We performed a patch test with a piece of a cordura trilaminate diving suit. There was no reaction. The patient is now diving with this drysuit and does not suffer from any skin complaints.

Discussion

Neoprene was first synthesized in 1930 and is one of the earliest synthetic rubbers (1). Neoprene is commonly used in wetsuits, gloves, shoe insoles and adhesives, orthopaedic braces and splints, continuous positive airway pressure (CPAP) masks, car weather strips, and keyboard wrist supporters (1).

Thiourea and its derivatives have been used in the rubber industry as accelerators in the vulcanization process. Thiourea compounds can cause allergic contact dermatitis. *N,N'*-Diethylthiourea is used in the manufacture of some types of rubber and paint. Diethylthiourea is also used as a corrosion inhibitor in metal pickling solutions (2).

All case reports on neoprene contact reactions describe type IV reactions (3). Frequent causes of contact dermatitis in divers are because of goggles, flippers, snorkels, and rubber suits. The antigenic substances in these materials are thiuram, mercaptobenzothiazole, formaldehyde, dithiocarbamates, ureaformaldehyde resins, isopropyl-phenyl-paraphenylenediamine, and paraphenyldiamine (4). Contact dermatitis as a result of neoprene in a wetsuit must be differentiated from irritant contact dermatitis, contact reactions to water, and physical urticarias (e.g. dermographism, delayed pressure urticaria, cholinergic urticaria, and cold urticaria).

4. Balestrero S, Cozzani E. Allergic contact dermatitis from a wet suit. *J Eur Acad Dermatol Venereol* 1999; 13: 228–229.

Address:

Elisabeth B. M. Kroft
Department of Dermatology
Radboud University Nijmegen
Medical Centre
PO Box 9101
NL-6500 HB Nijmegen
The Netherlands
Tel: +31 24 3617245
Fax: +31 24 3541184
e-mail: i.kroft@derma.umcn.nl

References

1. Woo D K, Militello G, James W D. Neoprene. *Dermatitis* 2004; 15: 206–209.
2. Adams R M. Contact allergic dermatitis due to diethylthiourea in a wetsuit. *Contact Dermatitis* 1982; 8: 277–278.
3. Kanerva L, Estlander T, Jolanski R. Occupational allergic contact dermatitis caused by thiourea compounds. *Contact Dermatitis* 1994; 31: 242–248.