

Allergic contact dermatitis to 2(thiocyano-methylthio) benzothiazole present in a packaging wood

Contact Dermatitis 2007; 57: 121–122

H. Domingo, J. M. Carrascosa, A. Boada
L. Leal and C. Ferrándiz

Department of Dermatology, Hospital
Universitari Germans Trias i Pujol,
Universitat Autònoma de Barcelona,
08916 Badalona, Spain

Key words: 2(thiocyano-methylthio)benzothiazole; packaging wood; pesticide; TCMTB; wood preservative.

Case Report

A 57-year-old man who worked at a packaging factory had developed recurrent and pruritic cutaneous lesions on his wrists and dorsa of hands over the past year, corresponding with subacute, slightly desquamative eczematous plaques. The patient wielded packaging boxes made with varnished woods. Despite of the recommendations, he did not use gloves to protect himself. During this time, the lesions had occasionally extended to the trunk and the limbs. Although topical steroids were partially effective in the management of the cutaneous lesions, they recurred shortly after stopping the treatment.

The history of patient's occupation did not apparently show any suspicious allergen directly related to his job. Nevertheless, he referred clinical exacerbations when coming in contact with the varnished wood used in the packaging procedure, which had been previously treated with some preservation products.

Patch tests were performed with the True test® (Hillierod, Denmark) + (Grupo Español de Investigación en

Dermatitis de Contacto (GEIDC)) Spanish standard series allergens, as well as with plastics and glue series (Trolab®, Hermal®, Reinbeck, Germany). All of the substances tested were negative at day (D) 2 and D4. An open test with a 1% aqueous solution of the wood preservative, named MIRECIDE-TC/45-GLICOL® (Lamirsa®, Terrassa, Spain), in which the active ingredient is 2(thiocyano-methylthio)benzothiazole (TCMTB) at 30%, as well as patch tests with progressive dilutions (1/10, 1/100, and 1/1000) were positive at D2 and D4. The same patch test with this last dilution gave negative results in 5 healthy control subjects. Patch test with the preserved wood was not performed. The manufacturer kindly provided us with all components of MIRECIDE-TC/45-GLICOL. Further testing with all these components trying to reproduce its concentration in the final aqueous solution showed a strong positivity only to TCMTB. Testing with progressive dilutions 1/100, 1/200, and 1/400 in petrolatum (pet.) with an 80% TCMTB solution gave positive reactions after 2 and 4 days, while they were negative in 10 control subjects. Surfactant from Mirecide-TC/45 gave a weak positivity when tested at 2.5%. Nevertheless, this reaction was considered irritant because it disappeared when the surfactant was diluted in water at 1/100, 1/200 and 1/400. Avoiding contact with TCMTB resulted in complete resolution of the cutaneous lesions in a few weeks.

Discussion

TCMTB is a benzothiazole fungicide, with both anti-fungal and anti-mould activity, commonly used in the industry as a wood preservative. Although it works as a primary irritant when used at high concentrations, occupational adverse events related to this substance are rare despite its widespread use in the wood protection industry, probably due to the low concentrations present in the manufactured products (1). Dermal contact is the main route of occupational exposure, particularly in sawmill workers (2). Described adverse effects include skin rashes, inflammation or burns as well as eye, nose, and throat irritation. Chest tightness and nose-bleeds have also been reported (3). Allergic contact dermatitis to TCMTB

has been only rarely reported, being the wood workers who are in contact with the aqueous solution of this substance the most usually affected. TCMTB has been also described as the aetiological factor of contact dermatitis in patients with foot eczema when used as biocide leather (4).

The patient here reported did not work as a wood processor but as a packaging employee. Because of this, he was not in contact with the aqueous solution of TCMTB but with the treated wood. The recommended concentration of Mirecide-TC/45 when used as a preservative is ranged at 1–1.5% in water. Thus, the concentration of TCMTB (30% of Mirecide-TC/45) in the wood used is expected to be about 0.3% to 0.4%. This particular route of sensitization, which has not been previously described to the best of our knowledge, was first difficult to suspect on the basis of the patient's occupational tasks. Patch test concentration of TCMTB has been recommended at 0.1% in pet. Nevertheless, studies with this substance are sparse (4). Our patient was tested with a concentration of 0.2% in pet., which was even lower than the expected concentration in the treated wood. On the contrary, it must be reminded that none of the 10 healthy controls tested had irritant reactions.

Our case shows that TCMTB is able to induce allergic dermatitis on sensitized patients even if they do not manipulate directly this substance and supports the importance of clinical history as well as a careful evaluation of occupational environment.

References

1. Hanssen H W, Henderson N D, Ward J E H. *Review of the Environmental Impact and Toxic Effects of TCMTB*. Government Environment Protection Division, Victoria, British Columbia, 1993.
2. Teschke K, Hertzman C, Wiens M et al. Recognizing acute health effects of substitute fungicides: are first-aid reports effective? *Am J Ind Med* 1992; 21: 375–382.
3. Manninen A, Auriola S, Vartiainen M, Liesivuori J, Turunen T, Pasanen M. Determination of urinary 2-mercapto-benzothiazole (2-MTB), the main metabolite of 2(thiocyano-methylthio) benzothiazole (TCMTB) in humans and rats. *Arch Toxicol* 1996; 70: 579–584.
4. Nardelli A, Taveirne M, Drieghe J, Carbonez A, Degreef H, Goossens A.

The relation between the localization of foot dermatitis and the causative allergens in shoes: a 13-year retrospective study. *Contact Dermatitis* 2005; 53: 201–206.

Address:

*Helena Domingo
Department of Dermatology
Hospital Universitari Germans Trias i
Pujol
Ctra del Canyet s/n
08916 Badalona
Spain
Tel: +003 4934 978813
Fax: +003 4934 978754
e-mail: domingoherranz@hotmail.com*