

¹Department of Dermatology, Faculty of Medical Sciences, University of Fukui 23-3 Shimoaizuki, Matsuoka, Eihei-cho, Yoshida-Gun, Fukui 910-1193, and

²National Institute of Health Sciences, Kamiyoga 1-18-1, Setagaya-ku, Tokyo 158-8501, Japan

Key words: allergic contact dermatitis; desk mat; patch test 2,3,5,6-tetrachloro-4(methylsulphonyl) pyridine; prurigo nodularis.

Prurigo nodularis is a characteristic chronic dermatosis of unknown etiology, showing intensely itchy nodules mainly on the extremities (1). An association of allergic contact dermatitis and prurigo nodularis was also documented (2). Here, we report a case of prurigo nodularis occurring as a direct result of allergic contact dermatitis from 2,3,5,6-tetrachloro-4(methylsulphonyl) pyridine (TCMSP).

Case Report

A 45-year-old woman, with no personal or family history of atopy, consulted our office in September 2005 with complaints of papulonodules on the extensor surface of her forearms. The lesions were associated with severe itching. She worked in an office as a computer operator. Since 2003, she had covered her desk with a desk mat coated with antimicrobial agents. After several months, she developed diffuse erythema with itching on her forearms. Subsequently, she developed discrete papulonodules on her forearms, resembling prurigo nodularis. She was treated with topical corticosteroids and antimicrobial agents at several other clinics, but the lesions did not resolve and the cause remained unknown for 3 years. On physical and routine laboratory examinations, the patient was apparently healthy. Total serum immunoglobulin E was 75 IU/ml and human immunodeficiency virus (HIV) antibody was negative.

She was patch tested with the Japanese standard allergen series and her desk mat in October 2005. The patch testing and reading were carried out according to the International Contact Dermatitis Research Group recommendations using Finn Chambers[®] (Epitest, Helsinki, Finland) and Scanpor[®] (Norgesplaster A/S, Oslo, Norway) tape. At D2 and D3, the patch test with the desk mat (as is), containing 0.3% TCMSP,

showed a strong positive reaction. There were no positive reactions on other patch tests. Further patch-testing with 5 constituents of her desk mat provided by the manufacturer, pyridine derivatives and other microbial agents was performed. Strong positive reactions to TCMSP (0.3% and 0.01% in pet.) were obtained, although there were no positive reactions to any of the 4 other constituents of her desk mat. A positive reaction to tetrachloroisophthalonitrile (TCPN 0.3% in pet.) was also obtained. In addition, a lymphocyte-stimulating test showed a strong reaction to TCMSP, with a stimulation index 407% (normal < 180%). The patient stopped using the desk mat containing TCMSP. Consequently, the prurigo nodules cleared after 2 months. There has not been any recurrence for 18 months.

Discussion

Pyridine and its derivatives are widely used in many countries, mainly in chemistry. Descriptions of occupational allergy to pyridine derivatives are available in the literature (3–5). TCMSP belongs to the pyridine/quinon group, and has been used as an antifungal and antibacterial agent in paint, polyvinyl chloride leather, desk mat, ship bottom antifouling agent, and other products. Some trademarks are Densil S100, Dowco 282, Dowicil S13. Percentage purity is 100%. Physical state at 20°Celsius is off-white to grey crystalline powder. The CAS no. is 13108-52-6. Several studies of allergic contact dermatitis because of TCMSP in desk mat and polyvinyl chloride leather have been reported in Japan (5–7), they documented that TCMSP 10% and 20% olive oil was not a skin irritant. However, TCMSP was proven to be both an irritant and a strong allergen in the guinea pig maximization test (8). Therefore, we did not carry out patch testing with TCMSP concentrations above 0.3% on the patient and control. Some cross-reactions have been reported between pyridine and its derivatives (4, 8). Our case showed a cross-reaction between TCMSP and TCPN. After several cases of allergic contact dermatitis because of TCMSP in the desk mats were reported, the manufacturer (Kokuyo Co. Ltd, Osaka, Japan) decided to recall all desk mat containing TCMSP in October 2006.

Prurigo nodularis occurred in a patient with an allergy to pyridine derivative in desk mat

Contact Dermatitis 2008; 58: 250–251

Toshiko Ido¹, Wataru Takashima¹, Takahiro Kiyohara¹, Masanobu Kumakiri¹ and Masaaki Kaniwa²

Prurigo nodularis is a chronic pruritic papulonodular eruption of unknown cause. The diagnosis of prurigo nodularis is based on clinical findings. Many factors that predispose patients to scratch have been described, such as atopic diathesis, insect bite, psychological factors, renal failure, liver disease and, HIV infection. According to the report (2), allergic contact dermatitis may also result in papulonodular eruption. Our patient had been in contact with the desk mat and papulonodules that developed on her forearms were persistent despite repeated local corticosteroid therapy for 3 years. There was improvement apparently related to the desk mat avoidance. Based on her clinical history, positive patch test and positive lymphocyte stimulating test, we concluded that the patient's prurigo nodules were caused by TCMSP allergy. To our knowledge, the above case is the first report of prurigo nodularis in a patient with contact hypersensitivity to TCMSP. Appropriate patch testing with environmental products may be worth consideration in some refractory cases of prurigo nodularis.

4-(methylsulfonyl)pyridine in guinea pig maximization test. *Seikatsu Eisei* 2006; 50: 76–83.

Address:
Toshiko Ido, MD
Department of Dermatology
Faculty of Medical Sciences
University of Fukui
23-3 Shimoaizuki
Matsuoka
Eiheiji-Cho
Yoshida-Gun
Fukui 910-1193
Japan
Tel: +81 776 61 3111
Fax: +81 776 61 8112
e-mail: ido@u-fukui.ac.jp

References

1. Rowland Payne C M E, Wilkinson J D, Mckee P H, Jurecka W, Black M M. Nodular prurigo – a clinicopathological study of 46 patients. *Br J Dermatol* 1985; 113: 431–439.
2. Zelickson B D, Mcevoy M T, Fransway A F. Patch testing in Prurigo nodularis. *Contact Dermatitis* 1989; 20: 321–325.
3. Foussereau J, Lantz J P, Grosshans E. Allergic eczema from vinyl-4-pyridine. *Contact Dermatitis News Lett* 1972; 11: 261.
4. Sasseville D, Balbul A, Kwong P, Yu K. Contact sensitization to pyridine derivatives. *Contact Dermatitis* 1996; 35: 100–101.
5. Oi M, Sumi K, Yokozeki H. Occupational allergy in office workers caused by the antifouling desk mat. *Contact Dermatitis* 2006; 54: 60–61.
6. Gushi A, Kanazaki T, Katahira H, Miyoshi H, Kanazaki T. Contact dermatitis from antimicrobial coating of a desk mat. *Contact Dermatitis* 2003; 48: 347–348.
7. Huh W, Masuji Y, Tada J, Arata J, Kaniwa M. Allergic contact dermatitis from a pyridine derivative in polyvinyl chloride leather. *Am J Contact Dermatitis* 2001; 12: 35–37.
8. Noda T, Yamano T, Ooshima T, Shimizu M. Contact allergenicity and cross reactivity of 2,3,5,6-tetrachloro-