

Delayed diagnosis of occupational contact dermatitis from sodium pyrithione in a metalworking fluid

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Key words: allergic contact dermatitis; CAS no. 3811-73-2; lack of cross-sensitivity; metalworking fluids; occupational, sodium pyrithione; zinc pyrithione.

Case Report

A 57-year-old machinist, who had been working on centreless grinding in the same plant for 18 years, was referred because of an itchy dermatitis on the back of his left hand, present for 4 years during work but clearing on holidays. When working he always picked up the objects to be honed with his left, unprotected hand, thus exposing it to a water-based metalworking fluid (MWF), which had been in use for over 15 years. Before referral, a private dermatologist had performed standard patch testing showing contact allergy to both methylchloroisothiazolinone (+) methylisothiazolinone and Myroxolon Pereira resin. Furthermore, he had been put on sick leave resulting in total clearance of his dermatitis. He was patch tested to our standard series, our metalworking series and his own MWF. Positive patch test results are shown in Table

1. Zinc pyrithione (1.0% petrolatum (pet.), Chemotechnique Diagnostics, Malmö, Sweden) was also patch tested.

Discussion

The patient was allergic to sodium pyrithione (0.1% aq., Chemotechnique Diagnostics, Malmö, Sweden), tested twice to confirm the diagnosis. Sodium pyrithione is purchased by Chemotechnique Diagnostics as a 40% solution in water, termed sodium omadine, but the patch test concentration is 0.1% active ingredient (personal communication, Chemotechnique Diagnostics, Malmö, Sweden) (1). Sodium pyrithione was a component of his MWF, present at 0.1–1.0%. The 'use' concentration of the MWF brought by the patient for testing was unclear, which may explain the doubtful patch test reaction (Table 1). However, he reacted unequivocally to the unused, concentrated MWF at 5.0% in acid buffer.

2 years prior to presentation, a large survey on occupational skin disease had been undertaken at his plant, but because of holiday he had not participated, although he suffered from dermatitis. In the survey, we patch tested 181 workers with sodium pyrithione but did not detect any allergic individuals. We also patch tested several MWFs but not the one that this patient worked with (2). Sodium pyrithione has been present in MWF series since at least the 80s, but only 2 cases of contact allergy to this preservative in MWFs have been published (1, 3).

Zinc pyrithione, another metal salt of pyrithione, used in antidandruff shampoos, is said to cross-react with sodium pyrithione, since the hapten

is the pyrithione moiety (1). The patient denied using such shampoos and had also never experienced any skin complaints from shampoos. According to 1 author, either zinc or sodium pyrithione can be used for patch testing, pet. being a more practical diluent than aq. (1), but our patient did not react to zinc pyrithione on patch testing, even though he was tested with a higher concentration than he was with sodium pyrithione (sodium pyrithione 0.1% = 0.007 mol; zinc pyrithione 1.0% = 0.032 mol). This discrepancy may be due to different absorption from the 2 vehicles.

In the 2 previous reports (1, 3), zinc pyrithione was not tested. Since 1995, we have had 2 patients reacting to sodium pyrithione but they did not work with MWFs, the clinical relevance was unclear and they were not tested with zinc pyrithione. We have not seen any patients positive to zinc pyrithione since computerizing our patch test results in 1985. In the cases of contact allergy to zinc pyrithione reported in the literature (4–6), sodium pyrithione was not tested either, so a comparison between the 2 metal salts of pyrithione has not been performed.

The other contact allergies were considered to be of past relevance.

References

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Table 1. Patch test results

Test substance	Concentration (%)	Vehicle	D4	D7
Methylchloroisothiazolinone (+)	0.02	Aq.	+++	+++
Methylisothiazolinone				
Methyldibromo glutaronitrile	1.0	Pet.	+	
MWF diluted (use concentration)	as is	–	?	–
MWF concentrate	5.0	Acid buffer	++	ND
MWF concentrate	0.5	Acid buffer	(+)	ND
Sodium pyrithione	0.1	Aq.	+	(+)
Sodium pyrithione (retest)	0.1	Aq.	+++	ND
Zinc pyrithione	1.0	Pet.	–	ND

MWF, metalworking fluid; ND, not done.

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Allergic contact dermatitis from trimethylolpropane triacrylate and pentaerythritol triacrylate

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Key words: (meth)acrylates; allergic contact dermatitis; chemical industry; cross-reaction; diapers; occupational; pentaerythritol triacrylate; superabsorbent polymers; trimethylolpropane triacrylate.

Case report

A 37-year-old supervisor at an industrial chemical company making crys-

tals for baby diapers complained of an itchy red blistering rash on his forearms and calves for 6 months. The onset of this rash occurred soon after accidental contamination of his arms and legs with trimethylolpropane triacrylate (TMPTA), when a pipe carrying the chemical had burst, spilling its contents onto the floor. His rash became scaly subsequently and gradually improved over 3 months after using a cream prescribed by his company doctor. He noticed that the rash was better on days off and was worse when he felt hot and sweaty at work. The rash further improved after he left his job 3 months after the incident.

When he was examined 6 months after the onset of his rash, there were patches of postinflammatory hyperpigmentation and scaling over both forearms and both calves.

Patch tests showed ++ reactions to TMPTA 0.1% pet. and pentaerythritol triacrylate (PETA) 0.1% pet. (Chemotechnique Diagnostics, Malmö, Sweden) on D2 and D4. He was diagnosed to have allergic contact dermatitis from TMPTA with possible cross-reaction with PETA.

Discussion

The multifunctional acrylates TMPTA and PETA were first introduced into ultraviolet-cured printing inks in 1974. Allergic contact dermatitis from TMPTA and PETA was first reported by Emmett and Kominsky (1) in 1977. Many of the patients reacted to multiple acrylates and the possibility of cross-sensitization or concomitant sensitization was entertained. Since then, there have been further reports of allergic contact dermatitis from TMPTA and PETA in ultraviolet-cured inks by Bjorkner *et al.* (2) and Nethercott *et al.* (3).

In this case, the acrylate was used industrially to manufacture superabsorbent polymers, e.g. sodium polyacrylate or polyacrylamide crystals, that were used in diapers. Other uses of superabsorbent polymers are in gel ice, fire fighting, municipal water treatment, toothpaste and cosmetics. This is the first report of allergic contact dermatitis from TMPTA in this industry.

The Society of British Printing Ink Manufacturers (SBPIM) have long advised that TMPTA and PETA be excluded from ultraviolet-cured formulations (4). However, these chemicals are still currently being used in other industries unrelated to printing.

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