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Resolution of Occupational Dermatitis Related to Manganese Exposures

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To the Editor

Manganese (Mn) is a transitional metal element, commonly used in industrial metal alloys. There are few reports about patients with Mn allergy.^{1–3} As far as we know, there are only 2 case reports of Mn allergic contact dermatitis in which both patients demonstrated positive reaction to Mn patch testing.^{1,3} Herein, we describe a patient with a positive patch test to Mn whose dermatitis resolved after his retirement from his work at a Mn processing plant.

A 55-year-old white man who worked as an instrument technician in a Mn-producing factory for 38 years presented with erythematous scaly patches on both arms and the dorsum of the hands for 5 years. He worked in an office adjacent to the Mn processing plant. A routine safety monitoring of his work environment revealed high levels of Mn-containing dust on his desk. The patient and his family denied any history of atopy. In addition, none of other workers in that facility had any dermatitis similar to this patient.

Patch testing with the North American Tray and extended metal tray, including 2.5% of Mn (II) chloride (MnCl₂), was performed. The readings were done at 48, 72, and 168 hours after

test placement. The results were all negative, except for Mn, which revealed reactivity at 2+, with negative delayed readings (72 and 168 hours). Because of persistent dermatitis that required the use of super-potent topical corticosteroids and his occupational exposure to Mn, we repeated patch testing to Mn during a period of 4 years on the upper back, and skin test reactivity varied from +/–2 to 2+ at 48 hours, with consistently negative delayed readings. These patch tests were interpreted as irritant reactions, and we discussed the possible relevance to the patient's work-related exposures. He was not able to change the nature of his work.

MnCl₂ is a potential allergen included in the extended metal series. However, irritant reactions to Mn patch testing are common. Eighteen patients with metal implants were studied with the extended metal series. Eight patients (44%) showed irritant reactions to 5% MnCl₂.⁴ Another study using 2.5% MnCl₂ (MnII) showed a higher rate of irritant reactions than Mn(III) or Mn(VII) at the same concentration. In addition, this study also confirmed that only Mn(II) was toxic to human keratinocytes.⁵ We interpreted the skin reactivity to Mn patch test in our patient as an irritant reaction, indicating that the commercially available concentration for Mn testing may be too high.

Three years after his retirement from his work at the Mn processing plant, his dermatitis had completely resolved, no longer requiring the use of topical corticosteroid therapy. Considering the high rate of irritant patch test reactions to Mn, our initial interpretation of the patch test reaction to Mn was that of an irritant reaction. Considering the clinical correlation with the patient's marked improvement of his chronic dermatitis after permanent removal from his work-place exposures to Mn, we are now interpreting the significance of the positive patch test as being allergic in nature.

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