

When sneakers turn out to be false friends: Allergic contact dermatitis to chromium in a 4-year-old child with atopic dermatitis

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Chromium (Cr), the third most common metal allergen in many countries, is used to tan most leather products to provide softness and durability.^{1,2} The typical Cr-allergic patient presents with foot dermatitis due to Cr-exposure from leather footwear.² Although people of all ages can develop Cr-footwear allergy, it rarely occurs in the pediatric population. We report here a case of allergic footwear dermatitis in a 4-year-old boy with atopic dermatitis (AD) caused by Cr despite wearing seemingly leather-free sneakers.

CASE REPORT

A 4-year-old boy with AD was referred due to dermatitis in both feet of 20 days' duration. The patient had had dyshidrotic eczema on the palmar regions 1 year before. History showed that he had started wearing a new pair of sneakers, seemingly devoid of leather parts, 1 month before the onset of the skin lesions. Cutaneous examination showed symmetrical patches over both soles, with hyperkeratosis, scaling, and erythema (Figure 1). The lesions were intensely itchy and mildly painful, especially when sweating occurred. A diagnosis of allergic contact dermatitis was suspected in view of the clinical pattern and onset after 2-month contact with sneakers. Patch testing with the AL test (Euromedical, Calolziocorte, Italy) on Scanpor tape (Norgesplaster, Venesla, Norway) fixed on the upper back with Hypafix (BSN Medical, Hamburg, Germany) and occluded for 2 days was performed. The patient was tested with the Italian baseline series maintained by the Italian Society of Allergological, Occupational and Environmental (SIDAPA) and dimethyl fumarate 0.01% pet. Readings revealed a strong positive reaction (++) to potassium dichromate 0.5% pet. on days 2 and 4 (Figure 2). The patient did not react to other allergens.

Cr-free footwear was recommended. Over 2 weeks, the dermatitis gradually cleared after avoidance of the sneakers and application of topical betamethasone dipropionate cream.

DISCUSSION

Contact allergy is common and increasing in children, and may have important repercussions on quality of life and social relationships.³ Contact allergy in children is thought to be caused by a high exposure to allergens at a younger age, especially in case of breakdown of the skin barrier, as occurs in AD. However, the relationship between



FIGURE 1 Footwear dermatitis

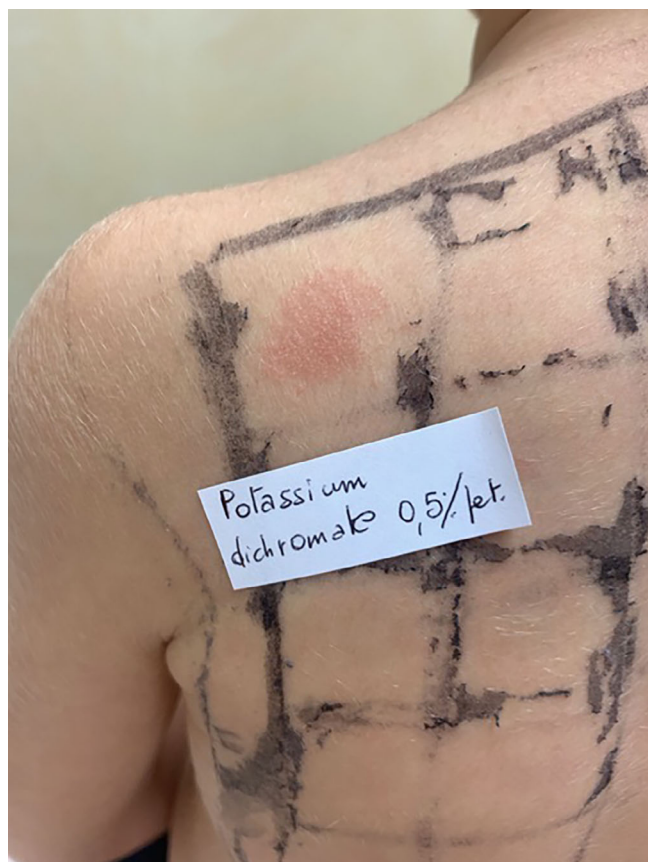


FIGURE 2 Patch testing showing a ++ reaction to potassium dichromate 0.5% petrolatum

contact allergy and AD is still controversial, with some studies reporting a reduced sensitization among patients with AD compared with nonatopics.⁴

Maceration and humid environment within footwear may play a crucial role in the development of foot allergic contact dermatitis in children, facilitating the penetration of potential allergens. Despite this, contact dermatitis from footwear, especially in the pediatric population, is relatively rare.³⁻⁵

Regarding Cr, the most common sources of exposure are thought to be leather footwear, followed by toy make-up and mobile phones.³ From May 2015, the level of Cr(VI) in leather articles placed on the markets of European countries that come into contact with the skin has been restricted to <3 ppm.² However, a reduction in the amount of Cr exposure remains an important health consideration.²

In our case, the clinical history and the presentation of the lesions over the soles were suggestive of contact allergy from some component of the sneakers, which seemed to contain no leather parts. Moreover, the previous dyshidrotic eczema experienced by the patient may be regarded as the consequence of condensed Cr allergens excreted along with sweat in the palmar regions. Indeed, metal allergy is regarded as one of the most important potential etiologic factors for dyshidrotic eczema.⁶

It would have been interesting to dissect the various components of the sneakers and patch test them separately. However, it was impossible to trace back all the chemical products contained in the sneakers in use. Therefore, in our patient, only circumstantial evidence, although strong, supports the causative role of Cr in inducing contact allergy.

CONFLICT OF INTERESTS

None to declare.

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