

Short Communication

Allergic contact dermatitis caused by nickel and cobalt in green plastic shoes

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Case Report

A 27-year-old nurse working in an intensive care unit, presented in 1997 with itchy dermatitis on the dorsum of both feet and toes, which had appeared 7 days after starting to wear a new pair of green plastic shoes at work (Fig. 1).

Patch testing revealed, at D4 only, a ++ reaction to potassium dichromate (0.5% pet.) and a +++ reaction to both cobalt chloride (1% pet.) and nickel sulfate (5% pet.). Scrapings of the new shoes gave a ++ reaction, but not scrapings from the previous shoes that she had worn. The patient was told to resume wearing the old pair of shoes and her dermatitis cleared.



Fig. 1. The green plastic shoe.

Chemical analysis of shoe

A spot test with dimethylglyoxime and ammonia failed to detect the presence of any nickel in the shoe. A piece of the shoe (4 cm²) was analyzed by particle-induced X-ray emission (PIXE), with a micro-beam accelerator, at the division of Nuclear Physics, Lund University. The presence of many elements was revealed, including nickel and cobalt in concentrations of 5.6 mg/kg (ppm) and 4.9 mg/kg, respectively. Unfortunately, the old shoe was not available for such chemical analysis.

Discussion

Nickel, and concomitantly cobalt, contact allergy causing lesions on the dorsal aspects of the feet, is generally due to buckles, eyelets and other metallic parts in shoes (1). Moreover, cobalt allergy is also often associated with chromate dermatitis due to leather shoes (2). Nickel and cobalt compounds, however, are also used as dyes and pigments, which were probably the causal factors in this case.

References

1. Taylor J S, Podmore P. Shoes. In: Rycroft R J G, Menné T, Frosch P J, Lepoittevin J-P (eds): *Textbook of contact dermatitis*. 3rd edition. Berlin: Springer-Verlag, 2001: 751–766.
2. Doms-Gossens A. Les dermatoses de contact aux pieds. *Bulletin d'Actualité Thérapeutique Dermato-Allergie* 1991; 26: 3603–3609.