

Allergic contact dermatitis to colophonium-contaminated socks

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Colophonium (rosin) obtained from sap of pine trees is frequently used in adhesives and glues. It is a complex mixture containing up to 50% of abietic acid, which is its principal sensitizer (1, 2). In a recent publication, Strauss and Wilkinson (3) reported a case of shoe dermatitis due to colophonium used as leather tanning or finishing agent in Portuguese shoes.

Case Report

A 51-year-old Portuguese healthy non-atopic man presented with 2-year history of chronic dermatitis on the soles and dorsum of both feet.

Patch testing (IQ Ultra Patch Tests Chambers; Advanced Technology from Chemotechnique Diagnostics, Malmö, Sweden) with the European baseline series, preservatives, shoe

series and a sample of his own shoes (fixed with tape) showed a positive reaction +++ at D2 and D4, to colophonium, as well as to his shoes. The patient stopped wearing these shoes, but after 2 months, the eczema, although less acute, was still present on both feet.

We performed a second session of patch tests with his own socks (one used and washed and the other new from the exact same brand, fixed with tape). It showed a positive reaction +++ at D2 and D4 to the used sock, but the test with the never worn sock was negative.

We performed an analysis of abietic acid by high-performance liquid chromatography (HPLC) in this used (but washed) sock (A) to see whether the sock could have been contaminated by colophonium. As a negative control, we tested a sock which he had never worn (B).

HPLC analysis was performed on Agilent 1100 equipment using an octadecyl silane (ODS) column (C₁₈) in isocratic conditions [methanol/0.2% acetic acid (95:5) at 1 ml/min] with ultraviolet detection. Pure abietic acid showed a maximal absorption peak at 239 nm and a retention time of 7.41 min. For sock A, the analysis of the ethanolic extract showed a peak at 7.33 min, with the absorption spectrum of abietic acid, whereas for sock B, no peak absorbing at $\approx$ 240 nm was observed between 7 and 8 min. This clearly demonstrated the presence of abietic acid in sock A only. The estimated quantity of abietic acid in sock A is 48 pmol/g (or 14.5 ng/g) and <0.3 pmol/g (or 0.09 ng/g) in sock B. A colophonium test containing 20% colophonium in petroleum, to which the patient showed a positive reaction +++ at D2, was analysed for colophonium by HPLC and contained 10% abietic acid.

Discussion

The detection of colophonium derivatives (abietic acid) in the used but washed socks and the absence of such derivatives in the socks which had never been worn suggests that these socks have been contaminated through the incriminated shoes and were probably also responsible for the persistence of symptoms, even after he stopped using his Portuguese leather shoes.

Although less commonly used in European shoe industry, it has been

recently reported that colophonium may still be used in shoe manufactures in Portugal as a leather additive or in the finishing process. It is interesting to note that when footwear dermatitis is strongly suspected, common allergens including rubber chemicals, potassium dichromate, *p*-tertiary-butyl-phenol-formaldehyde resin, and colophonium must be tested, but it may be important to test the patient's own shoes and used, washed socks when symptoms persist despite relevant shoe avoidance.

References

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