

Allergic contact dermatitis caused by copper

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Contact allergy to copper is rare. Sensitization usually results from occupational exposure, and cases have been reported in workers handling coins (1, 2), people working with machinery (3), and dental personnel (4).

Case Report

The patient is a 5-year-old right-handed boy who presented to the dermatology department with a 2-year history of recurrent fingertip dermatitis, which was more pronounced on the first three digits of his right hand. He had a past history of asthma, but not of eczema or hay fever. The symptoms improved when he was away from home and school. Although the fingertip dermatitis responded to clobetasol propionate 0.05% ointment or tacrolimus 0.03% ointment and a bland emollient, it continued to reoccur intermittently. This led us to believe that the cause was exposure at his home or at school.

A detailed history showed that the patient enjoyed playing with marbles, a tablet computer, 1p and 2p coins, Lego®, and, in particular, a collection of >150 die-cast model cars that he liked to crash together, many of which had lost their paint. He was patch tested with the British Contact Dermatitis Society baseline series and metals series, with allergens and IQ Ultra™ chambers (Chemotechnique, Vellinge, Sweden). On day (D) 2 and D4, he had a strong positive (++) reaction to copper(II) sulfate pentahydrate 2% pet., and a negative reaction to nickel. A more haemorrhagic but less infiltrated response

to molybdenum 5% pet. was observed, but was probably an irritant reaction.

Die-cast model cars are made from a ZAMAC (zinc, aluminium, magnesium and copper) alloy, and 1p and 2p coins contain copper. We concluded that the patient had contact allergy to the copper in these items (5), causing his fingertip dermatitis. Advice was given to his parents on avoidance of copper, particularly a reduction in the handling of coins, and removing the cars with exposed metal. His mother reported an improvement to the affected areas over a period of 6 months with this intervention.

Discussion

This case is notable and unusual in identifying copper allergy in a child. The patient will need to be aware of the wide range of uses and potential exposure to copper in the future. Copper is used in jewellery, plumbing, dentistry, electronics, and clothing, and is an alloying metal in bronze and brass. Copper is also sometimes used in high concentrations in swimming pools (the copper deposits turn fair hair green) (6). The concentrations used may or may not be sufficient to cause allergic contact dermatitis in copper-sensitized swimmers.

It should also be noted that patch tests are prone to false-positive reactions because of nickel contamination of the metal patch testing solutions (7). However, in this case, the negative response to nickel strongly suggests that the copper-allergic response was valid.

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