

BRIEF REPORT

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SYSTEMIC CONTACT DERMATITIS TO NICKEL PRESENT IN COCOA IN 14-YEAR-OLD BOY

Abstract: Systemic contact dermatitis can be elicited in nickel sensitive individuals by oral nickel exposure from food with high content of this metal, such as cocoa. We present a case report of a nonatopic teenager who developed allergic contact dermatitis due to nickel, cobalt, copper, and palladium, but exacerbations of skin lesions were mainly related to cocoa consumption.

It is estimated that allergic contact dermatitis accounts for up to 20% of all dermatitis seen in children, and metals are among the most frequent sensitizers (1). Metals elicit skin lesions mainly as a result of a direct skin contact. Nonetheless, systemic routes of exposure to metals may also be responsible for the flares of widespread dermatitis.

CASE REPORT

A nonatopic 14-year-old boy with no body piercings was referred to the dermatology department of Medical University of Lodz due to disseminated dermatitis manifesting itself as erythropapular lesions on his trunk and extremities. Six months prior to hospital admission, he had developed papular lesions in the periumbilical area, but those first symptoms had been wrongly associated with mechanical trauma caused by a metal buckle. Parents reported aggravation of skin changes after consumption of chocolate and other food products containing cocoa. With no response to treatment with topical corticosteroids and systemic antihistamines, one dose of parenteral bethametasone (Diprophos) was administered, and subsequently skin symptoms significantly diminished. Nevertheless, recurrence of widespread symmetrical skin lesions was always observed 1 day after exposure to chocolate in his diet (Fig. 1A–C). Consequently, diagnostic tests were carried out at the Nofer Institute of Occupational Medicine. Patch tests with European Baseline Series (Chemotechnique Diagnostics, Vellinge, Sweden) performed according to the International Contact Dermatitis Research Group

criteria showed positive reactions to 1% cobalt chloride (after 96 hours, i.e., on D4+), 5% nickel sulfate (D4+++), 2% copper sulfate (D4+++), 2% palladium chloride (D4+++), and sesquiterpene lactone mix (D4+). Skin prick tests with common aeroallergens and cocoa (commercial kit; Allergopharma, Reinbeck, Germany) were negative. Cocoa-specific IgE were not detected in serum.

DISCUSSION

Both population-based studies and investigations of selected groups of children with eczema show that metals are among the most common contact sensitizers in this age group; however, polyvalent allergy to four metals has been rarely reported (2). Main source of sensitization to nickel is body piercing, but in males, exposure to metal clothing accessories plays a dominant role, which was the presumed explanation in the reported case (3).

Nickel dermatitis is usually elicited by a direct contact of the skin with metal objects. However, other routes of exposure to nickel, for example, oral intake, transfusion, inhalation, or implantation of metal medical devices, may also lead to dermatitis (4,5). In case when sensitized individuals are exposed to a hapten systemically (orally, transcutaneously, intravenously, subcutaneously, intramuscularly, or by inhalation) and develop widespread skin lesions, systemic contact dermatitis may be considered. It is typically manifested by flare-up reactions (such as maculopapular or vesicular eruptions) in previously positive patch test sites, sites of previous dermatitis, and on previously unaffected skin areas. Skin lesions are usually symmetrical and disseminated on the body. It is widely known that systemic contact dermatitis is rare compared to other types of eczema (6,7).

Food is rarely considered to contain significant amount of metals, particularly nickel. In a minority of nickel-sensitive individuals, oral intake of nickel may elicit systemic contact dermatitis in a dose-dependent fashion. As calculated in metaanalysis, approximately 1% of these individuals may be expected to develop a systemic reaction to a typical daily nickel exposure from drinking water and diet (i.e., 0.22–0.35 mg nickel), and 10% of them would react to higher exposure (0.55–0.89 mg), which theoretically could be attained by consuming food that has a high nickel content (8). High concentration of nickel is routinely found in some products such as cocoa, dried beans, peanuts, hazelnuts, sunflower seeds, oatmeal, wheat bran, and also in canned products. Moreover, nickel content in foods is partially determined by components of the soil in which it is grown, fungicides used on it, and the equipment used in handling the food (5). Since the systemic reaction to

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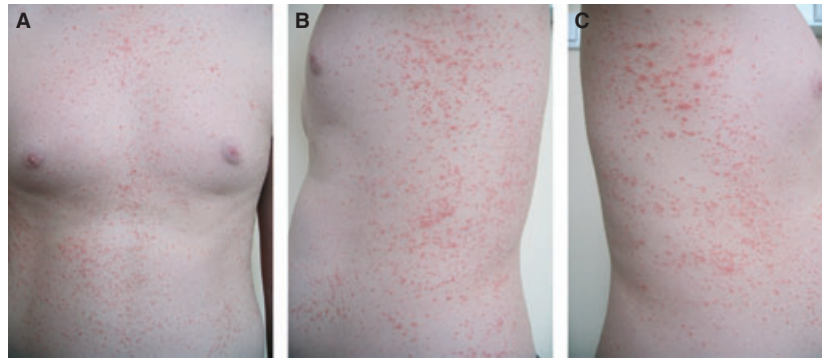


Figure 1. (A–C) Dissemination of widespread symmetrical skin lesions after oral exposure to cocoa in boy allergic to metals.

nickel is dose-dependent, dark chocolate (containing more than 0.5 mg nickel/kg) is more likely to elicit nickel-related systemic contact dermatitis than milk chocolate (0.1–0.5 mg nickel/kg) (9). In the reported case, type I hypersensitivity to cocoa was excluded; therefore, exacerbation of skin disease could have been related to traces of nickel found in food. Some authors recommend low-nickel or low-cobalt diet in individuals with food-related flares of metal dermatitis (10,11). In our patient, symptom management including low-nickel diet and avoidance of local exposure to metal objects resulted in disappearance of skin symptoms.

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