

Short Communication

Occupational fingertip protein contact dermatitis from grain flours and natural rubber latex

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Case Report

A 33-year-old non-atopic woman developed dermatitis. She had previously worked in a paper factory without skin symptoms, and was later trained to become a home help. After 2 years in this job, her first signs of allergy developed. During baking, various types of flour caused itching, whealing and burning of the hands and lower arms. Some months later, natural rubber latex (NRL) gloves also started to cause similar symptoms. Other gloves caused no problems. Condoms and pants elastic also caused whealing and itching. Later, the skin signs were predominantly eczematous. When seen at our clinic, the patient had severe dermatitis on her fingertips (Fig. 1) only.

Prick and patch tests were performed as previously described (1, 2). In a modified European standard series, nickel sulfate elicited a +++ patch test reaction. Other-

wise, the standard series, a rubber chemicals series (2) and an antimicrobial series were negative. In a dilution series, nickel sulfate was positive to the lowest concentrations tested: 0.1% caused a ++ reaction. On prick testing, NRL, wheat, rye, barley and oats gave histamine-sized (10 mg/ml; diameter 6 mm) wheal reactions. Vegetables, roots and fruits (avocado, banana, kiwi) were negative on prick testing. Radioallergosorbent tests (RASTs) to NRL and wheat, rye, barley (but not oats) were elevated, as was total IgE (249 kU/ml). The patient was advised to avoid NRL gloves and exposure to flour, and on a follow-up visit 6 months later, she was symptomless.

Discussion

Our patient had developed dermatitis from inexpensive jewellery in her teens, but avoided exposure to nickel metal and had no further metal-related symptoms. She had a family history of atopy but had not herself previously suffered from atopic symptoms. Her first signs of sensitization to proteins came from skin contact with grain flours and were typical of contact urticaria. Later, her skin symptoms changed into dermatitis, in accordance with what Hjorth & Roed-Petersen (3) termed protein contact dermatitis (PCD).

Janssens et al. (4) reviewed the reported cases of PCD up to 1992–1993. They concluded that 4 main groups of “proteins” cause PCD: (i) fruits, vegetables, spices and plants; (ii) animal proteins; (iii) grains; (iv) enzymes. Since then, additional cases of PCD caused by the above agents have been reported (5–21). PCD is mostly occupational and develops on the hands and forearms (4). Food handlers, kitchen workers, caterers, bar staff, food vendors, food packers, gardeners (4) and dairy farmers (21, 22) are mainly affected. Housewives (4) and, as in the present case, home helps, are exposed to the same types of protein allergens. It is evident that, in the above occupations, irritant factors also play an important rôle. Grain flours (3, 23–25) and NRL (16) have previously been reported as causing PCD.

The mechanism of protein contact dermatitis is not



Fig. 1. The patient's protein contact dermatitis was manifested as fingertip dermatitis.

known. According to the original report of Hjorth & Roed-Pedersen (3), the patients had an immediate skin test reaction to the causative agent, but did not have allergic patch test reactions. When Langerhans cells (LCs) were found to have IgE receptors, and IgE was found to be located on the LC membrane (26, 27), it was speculated that PCD would be an LC-mediated reaction. If LCs could initiate a delayed IgE-mediated allergic reaction, an allergic patch test reaction could probably be provoked by the allergen. Protein penetration through intact skin may be a limiting factor, however. Atopic dermatitis or irritant contact dermatitis may first be necessary for PCD to develop. Several agents have caused a combined Type I and Type IV allergic skin reaction (21) but, as mentioned above, a Type IV skin reaction need not be present for PCD to develop. In our case, as in the original cases of Hjorth & Roed-Pedersen (3), PCD may have been caused by an IgE-mediated immediate allergy combined with irritant factors. Anamnestic data combined with prick tests, RASTs, and patch tests to exclude allergic contact dermatitis, form the base of the diagnosis of PCD.

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