

Occupational protein contact dermatitis to chicken meat studied by flow cytometry

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Protein contact dermatitis is defined as a type of dermatitis caused by type I hypersensitivity to protein or proteinaceous allergens. This dermatitis was first identified in food handlers (1). Here, we report a case of protein contact dermatitis to chicken meat, which is studied using a flow cytometry basophil activation test.

Case Report

A 25-year-old woman was studied for dermatitis with urticaria affecting arms, forearms, supraclavicular fossae, and neck associated with pruritic exanthema in the face. For the past 6 years, she had been working as a butcher. The last year, she complained of dermatological symptoms at the workplace that improved during the weekend and disappeared when on holidays. She did not report a familiar or personal history of atopy. She attributed her symptoms to the use of 2 cleaning products containing glutaraldehyde and hexadines in the poultry section. The patient was also exposed to meat containing sulfites as additive. She wore gloves eventually but never when cutting up pieces of chicken. Epicutaneous patch tests for metal

salts, rubber glove components (antioxidant amines, mercaptobenzothiazole, thiurams, and carbamates), disinfectant products (formaldehyde, glutaraldehyde, and benzalkonium chloride), and sulfites were negative. Subsequently, prick tests with common aeroallergens (pollens, mite, cat, and dog danders), latex, fish, shellfish, amylase, papain, lamb, beef, pork, and chicken meats were performed (Dome-Hollister-Stier[®]; Dome Hollister Stier Stallergenes DHS, Paris, France). Positive skin test was obtained with chicken meat (wheal 6 × 7 mm). Furthermore, specific immunoglobulin E (IgE) against beef, pork, and chicken meats were determined by ImmunoCAP[®] (Phadia AB, Uppsala, Sweden). Interestingly, reactivity values were undetectable (<0.35 kUa/l).

The analysis of activated basophils was performed using CD63-FITC/CD123-PE/HLA-DR-PerCP reagent mixture (BD Biosciences, Erembodegem, Belgium) and using a FACScan flow cytometer (BD Biosciences) as previously described (2). Basophil activation was established by CD63 up-regulation and included a negative control (no stimulation), a positive control (stimulation with anti-IgE), and stimulation with 1/10², 1/10³, and 1/10⁴ chicken meat extract (1/10 w/v, DHS). Chicken meat extract was previously tested for non-specific basophil activation in a healthy and an atopic control. Stimulation with the extract induced the activation of 57% of the basophils (Fig. 1) in the patient's sample (basal CD63 expression was 7%).

Discussion

Protein contact dermatitis is a well-documented finding among food handlers (1). The allergenic sources involved in occupational contact dermatitis to chicken include meat, skin, and organs (1, 3, 4). Type I hypersensitivity is a pathological mechanism underlying protein contact dermatitis; however, combined type I and type IV allergies have also been reported (4). The diagnosis is currently based on the clinical history and a positive prick test against the suspected substance. As basophil activation analysis by flow cytometry has proven a reliable test for the diagnosis of different IgE-mediated allergies (5), basophil activation test with chicken meat was assayed to document this case of

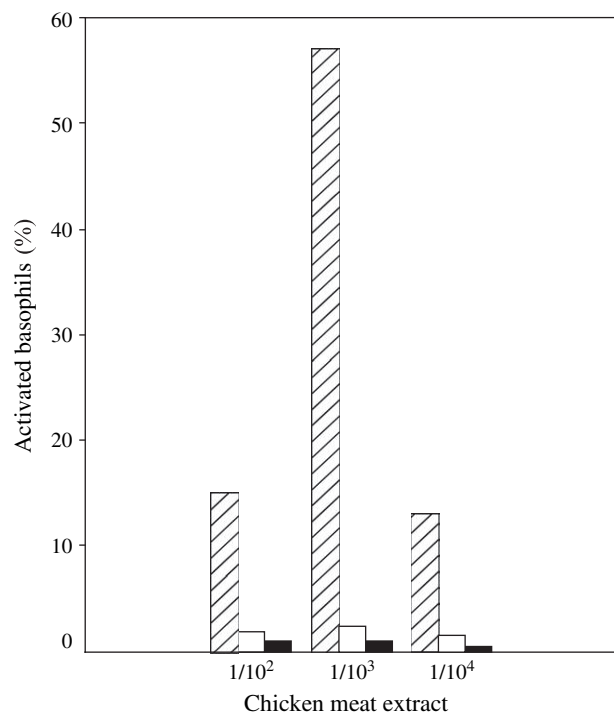


Fig. 1. Chicken-meat-induced basophil activation in a patient with protein contact dermatitis (striped bars), an atopic control (white bars), and a healthy control (black bars). Activated basophils (%) represent the percentage of CD63 up-regulation, as analysed by flow cytometry. Spontaneous CD63 expression and anti-immunoglobulin E-induced CD63 up-regulation in the patient's sample were 7% and 53%, respectively.

protein contact dermatitis. Interestingly, we show a disagreement between the prick test and the analysis of specific IgE. The results obtained

with this patient show that the basophil activation test may represent a useful technique for the study of protein contact dermatitis.

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