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Occupational allergic contact urticaria from chloramine-T solution

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Case Report

A 48-year-old hospital bath attendant developed itchy hand dermatitis. Half a year later, her dermatitis was accompanied by whealing on the wrists and forearms from spilling of a liquid disinfectant, Klorilli® (Orion-yhtymä Oy, Noiro Erisan-Farmos, Finland). Spillings had caused no skin reactions during the previous 6 months of exposure. She also developed stuffiness of her nose and sneezing when working with Klorilli®. She daily diluted concentrated Klorilli® to a 2% solution before use. She used disposable vinyl gloves and the reaction to Klorilli® appeared only on the unprotected skin of the wrists and forearms. Both concentrated and diluted Klorilli® caused symptoms. The diluted Klorilli® was used to disinfect surfaces in the hospital bathrooms. According to the material safety data sheet, Klorilli® contained 8.5% sodium-p-toluenesulfonylchloramide, $\text{CH}_3\text{C}_6\text{H}_4\text{SO}_2\text{NNaCl} \cdot 3\text{H}_2\text{O}$ (CAS 127-65-1), i.e., chloramine-T (Fig. 1). Accordingly, the diluted 2% solution of Klorilli® contained 0.17% of chloramine-T.

Prick testing with standard environmental allergens and flours was negative. Prick tests with chloramine-T conjugated with human serum albumin (HSA) (1) or in aq. gave the following reactions: chloramine-T-HSA 1.5% 15-mm diameter; chloramine-T 1% aq. 9 mm, 0.1% aq. 6 mm, 0.01% aq. 5 mm and 0.001% aq. 2 mm. Histamine hydrochloride 10 mg/ml gave a 6-mm reaction, whereas control tests with the vehicles (HSA and aq.) were negative. A radioallergosorbent test (RAST) to

chloramine-T (Pharmacia & Upjohn, Sweden) was performed 2×; it showed specific IgE antibodies, 9.1 kU/l and 6.4 kU/l, respectively, values >0.3 kU/l being defined as positive. A provocation test with 2% Klorilli® was negative on intact skin but provoked a 4-mm reaction on a skin site that 1 h earlier had been used for prick testing. A provocation test with undiluted Klorilli® containing 8.5% chloramine-T provoked a strong whealing reaction on intact skin. On patch testing, the patient had a +++ reaction to nickel sulfate in the standard series. The antimicrobial series was negative, and chloramine-T was negative in a dilution series (0.5%–0.001% aq.). It was concluded that the patient had developed occupational allergic contact urticaria from chloramine-T.

Discussion

Chloramine (NH_2Cl) and chloramine-T are 2 different chemicals (1, 2). Chloramine is an intermediate product in the manufacture of hydrazine. Chloramine-T (Fig. 1) is a crystalline powder, containing 11.5–13% active chlorine (3). Chloramine-T is commonly used as a sterilizer, antiseptic, disinfectant and chemical reagent. Its use has increased, e.g., in hospitals, because of the increased risk of HIV infection and hepatitis. Klorilli® solution containing 8.5% chloramine-T has recently been vigorously marketed in Finland as a disinfectant for hospital and dental personnel.

Allergic asthma caused by chloramine-T is well-known (1, 4–8) and the reactions are IgE-mediated (5–7), but skin symptoms have only seldom been reported (9–11). Lombardi et al. (11) reported a nurse who was positive on patch testing to chloramine-T (0.05% aq.). Our patient developed symptoms of contact urticaria and rhinitis at about the same time, without having any previous atopic history (12). However, in some cases, contact urticaria precedes allergic rhinitis and asthma (13). 1 previous case of occupational contact urticaria from chloramine-T powder has been published (9). Our patient is the 1st reported case of contact urticaria from chloramine-T solution. 1 case of occupational asthma due to chloramine-T solution was recently reported from Finland (14).

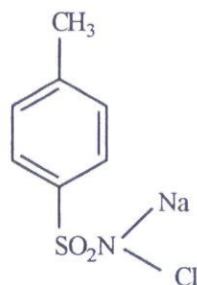


Fig. 1. Chemical structure of chloramine-T (syn. sodium-p-toluenesulfonylchloramide, CAS 127-65-1).

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Immunologic contact urticaria caused by asparagus

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Asparagus (*Asparagus officinalis*), a member of the Liliaceae family, is cultivated worldwide as a vegetable. There have been several reports describing contact dermatitis, which usually appears as an occupational hand eczema in food handlers (1).

Case Reports

Patient no. 1 was a 26-year-old housewife, in whom seasonal rhinitis and asthma caused by sensitivity to pollen were diagnosed. She had noticed over a 3-year period that contact with asparagus leaves elicited immediate erythema and pruritic wheals restricted to the contact area. She tolerated the ingestion of asparagus.

Patient no. 2 was a 29-year-old woman in whom pollen- and *D. pteronyssinus*-induced rhinoconjunctivitis and asthma were diagnosed. She had been working in a vegetable-processing plant for the last 3 years. 2 years after she had started this job, she began to notice symptoms of urticaria a few minutes after handling asparagus. She also presented symptoms typically localized in the mouth, after eating asparagus.

Rub tests (2) with asparagus were positive in both patients. Prick tests with an extract of asparagus (1/10 w/v) (3) were positive in patient no. 2 and negative in the other. Prick-by-prick tests (4) with asparagus and other vegetables of the Liliaceae family, such as onions and garlic, were positive in both patients. Open and closed patch tests (5) were negative with asparagus and the extract. Specific IgG was measured by the CAP system (Pharmacia Diagnostics, Sweden), class 2 or above being considered positive. Patient no. 1 was IgE positive to asparagus, onion and garlic (class 3), and patient no. 2 had specific IgE to asparagus (class 4), garlic and onion (class 3).

Results of the same tests performed in 15 atopic subjects and 15 healthy volunteers were negative.

Comment

Asparagus-causing symptoms of an IgE-mediated contact urticaria was identified in both cases. Both patients were sensitive to other members of the Liliaceae family (6). The comparative usefulness of prick-by-prick and

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