Dear Editor

The leek and onion belong to the family, liliaceae, which includes the garlic, onion, green spring onion, and asparagus. Previous reports discussed occupational dermatosis caused by a type-IV allergic reaction stemming from exposure to garlic,1,2 Other reports showed that liliaceae plants triggered asthma and anaphylaxis through IgE-mediated reactions.3-6 We present herein a rare case of contact urticaria triggered by leek, Chinese chive, and onion developing anaphylaxis in a hand eczema patient with atopic dermatitis.

A 38-year-old housewife presented with severe atopic dermatitis for which she had been treated in dermatological clinics. Her hands showed particularly severe erythema, erosion, fissures, and lichenization. She had experienced an anaphylactic shock several times while cooking at home. During the first episode, while handling the cooking ingredients, including beef, pork, garlic, Chinese chives, and leek, edema, rash, and wheals were spread from her hands to the whole of her body. Within 30 min, wheezing was begun. The second episode involving the same anaphylactic symptoms occurred thirty minutes after handling food containing beef, pork, onion, egg, and flour. Laboratory tests showed the total IgE at 86.9 IU/ml. The specific IgE RAST to onion, garlic, wheat, beef, pork and egg were negative. Prick-by-prick test was performed with a positive control of 10 mg/ml histamine and a negative control consisting of saline.7 The results of the prick-by-prick test showed positive reactions to onion (2+), leek (+/-), Chinese chives (1+), green spring onion (2+), and garlic (2+) after 15 min. Two healthy volunteers showed negative reactions to the same samples.

Onion, leek, Chinese chives, green spring onion, and garlic proteins were extracted from chopped unpeeled vegetables by phosphate-buffered saline (pH 8) at 200 mg/ml and centrifuged at 21500 g 4°C for 10 min. The supernatant proteins were measured and treated by NuPAGE® LDS sample buffer and NuPAGE® reducing agent (Life Science®, Zurich, Switzerland). SDS-polyacrylamide gel electrophoresis (SDS-PAGE) was performed with 4–12% NuPAGE® Bis-Tris Precast Gel (Life Technologies®, Carlsbad, CA, USA) and fractionated protein bands weighing variously from 15 kDa to 80 kDa were detected using Colloidal Blue Coomassie (Sigma–Aldrich) (Fig. 1a). Proteins were transferred to a nitrocellulose membrane by diffusion. For IgE immunodetection, membranes were incubated 24 h in a 10% solution of the patient’s serum, the negative control serum, and the serum of positive control patient who had garlic and onion allergy: when she took them orally, she developed anaphylaxis. Subsequently, alkaline phosphatase-conjugated mouse monoclonal B3102E8 anti-human IgE mAbs (Abcam®, Cambridge, UK) was added after dilution to 1/500. Finally the streptavidin, an alkaline phosphatase conjugate, was used for the detection of molecules. Western blotting of the patient’s serum with leek, green spring onion, Chinese chives, onion, and garlic showed bands in all lanes with a molecular mass of approximately 20 kDa (Fig. 1b-d). The bands of the positive control were detected at the same levels as these of the patient, while the negative control produced no detectable band. The patient consented to take a challenge test to determine whether she could eat any of the suspected liliaceae family vegetables without ill effects. Since experiencing anaphylaxis she had refrained from eating both raw and cooked liliaceae vegetables. The patient held a piece of raw onion in her mouth for 15 min but experienced neither anaphylaxis nor oral allergy. In this manner it was determined that the anaphylaxis in this case resulted from contact urticaria of hands following exposure to onion, leek, Chinese chives, green spring onion, and garlic, not from eating then.

Discussion

The liliaceae family, including onion, leek, garlic, Chinese chives, green spring onion and asparagus, reportedly induced type-I allergic reactions like anaphylaxis and asthma. Contact urticaria caused mainly by garlic and onion have been reported, although the total number of cases is small.3,6 The point of interest in this case is the unusual fact that the contact urticaria of hands developed into anaphylaxis. A previously published clinical review by Krogh et al. defines contact urticaria inducing anaphylaxis as stage IV anaphylaxis.8 However up to now there have been no reports of contact urticaria triggered by liliaceae plants inducing anaphylaxis. We suggest that liliaceae plant antigens were sensitized from the skin, possibly aided by the patient’s increased sensitization due to severe atopic dermatitis. Also remarkably, although the patient’s condition was diagnosed by prick test and IgE immunoblotting, she failed to induce anaphylaxis by oral challenge test using a piece of raw onion. The mechanism of contact urticaria is unknown. In interesting, contact urticaria’ patients can eat suspected food. To identify analysis of mechanism, we need to observe clinical feature and accumulation of the case.
Con

flict of interest

The authors have no conflict of interest to declare.

Tomoko Kobayashi, Tomonobu Ito*, Chizu Egusa, Tasuo Maeda, Takafumi Numata, Yukari Okubo, Ryoji Tsuboi

Department of Dermatology, Tokyo Medical University, Tokyo, Japan

* Corresponding author. Department of Dermatology, Tokyo Medical University, 6-7-1 Nishi-Shinjuku, Shinjuku-ku, Tokyo 160-0023, Japan.
E-mail address: tomonobu@tokyo-med.ac.jp (T. Ito).

References


Fig. 1. SDS-polyacrylamide gel electrophoresis (SDS-PAGE) and western blotting analyses of liliaceae vegetables. (a) Gel stained with Colloidal Blue Coomassie. M, marker; lane 1, leek; lane 2, green spring onion; lane 3, Chinese chives; lane 4, onion; lane 5, garlic. Immunoglobulin E (IgE) immunoblotting. (b) Patients’ serum. (c) Serum of healthy volunteer. (d) Serum of patient with garlic and onion allergy. Lane 1, leek; lane 2, green spring onion; lane 3, Chinese chives; lane 4, onion; lane 5, garlic.
