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CORRESPONDENCE

Respiratory hypersensitivity reaction related to ingestion of raspberry

A 27-year-old woman developed dyspnea and wheezing within 10 min after eating a piece of raspberry walnut cake, and visited an emergency hospital. Based on a presumptive diagnosis of anaphylaxis, she was successfully treated with intravenous corticosteroid and intramuscular injection of adrenaline. She was referred for further investigation. Her medical history included mild asthma, cat allergy, and bipolar disorder, being treated with pranlukast, quetiapine, lamotrigine, and lorazepam. She could eat bread containing wheat and heated eggs without problem after this attack. Laboratory tests showed normal serum level of immunoglobulin (Ig) E 44 IU/mL. Multiple antigen simultaneous test (MAST)-36 (BML Inc) to examine allergen-specific IgE showed 15.2 lumicount (LC) (class 3) of cat dander and 4.89 LC (class 2) of dog dander, whereas the other results were negative. Specific IgE antibodies to strawberry, peach, apple, walnut, Jug r1, egg yolk, egg white, ovomucoid, gluten, ω-5 gliadin, birch pollen tested by CAP fluoro-enzyme immunoassay (CAP-FEIA) and prick-to-prick tests with ingredients of the cake and their related foods, including raspberry, strawberry, blackberry, blueberry, apple, walnut, almond, peanut, wheat, egg yolk, and egg white, were all negative. Then, an open oral provocation test was performed on admission initially with

TABLE 1 Cases of hypersensitive reactions related to raspberry.

First author, year of publication, journal	Age (years)/ gender	Medical history, or remarkable episodes	Episodes of hypersensitive reactions	Results of allergy test
Sherson D, 2003, *Ann Allergy Asthma Immunol*[1]	35/Female	Working with mixing machines that coat chewing gum	Hay fever symptoms, wheezing, and breathlessness in association with inhalation of raspberry powder, used for coating chewing gum in her workplace	Specific IgE: raspberry: 0.84 kUA/L (positive) A prick test for raspberry powder: Positive Five episodes of reduced peak respiratory flow rate related to working with raspberry powder
Ciprandi G, 2014, *Eur Ann Allergy Clin Immunol*[3]	52/Female	Itching after contact with the peach peel	Anaphylactic shock immediately after ingestion of raspberry during a quiet walking tour in the Alps	Specific IgE: rPru p 3: 1.94 kUA/L A prick test for raspberry: Positive
Collins A, 2020, *Rev Med Liege*[4] [in French]	9/Male	ND	Two episodes of anaphylaxis following ingestion of strawberry and raspberry, respectively	Specific IgE: strawberry (f44) 4.42 kU/L, raspberry (f343) 4.98 kU/L, banana (f92) 0.96 kU/L, orange (f33) 1.1 kU/L, rPru p 3: 2.55 kU/L, and rBet v 1: 8.1 kU/L. Prick-to-prick tests: Positive for raspberry, blueberry, blackberry, cherry, peach, plum, walnut, and almond
Ito K, 2012, *J Environ Dermatol Cutan Allergol*[2] [in Japanese]	28/Male	Oral allergy syndrome due to peanut, kiwi, and mackerel	Anaphylaxis following ingestion of cake containing blueberry, raspberry, strawberry, and redcurrant	Specific IgE: strawberry 0.95 UA/mL (class 2) Prick-to-prick tests: Positive for blueberry, raspberry, strawberry, redcurrant, and peanut
Our case	27/Female	Mild asthma, cat allergy, bipolar disorder	Respiratory reaction following ingestion of raspberry walnut cake	Mast-36[a]: cat dander 15.2 LC (class 3), dog dander 4.89 LC (class 2), and Prick-to-prick tests: All negative Open oral provocation test: positive for raspberry (others: Not tested)

Abbreviation: ND, not described.

[a]MAST-36: Multiple antigen simultaneous test (BML Inc) to examine allergen-specific IgE.

raspberry. Twenty minutes after eating 1.5 pieces of raspberry (about 4.5 g), she developed discomfort of the throat, dyspnea, repetitive cough, audible wheezing, and tachycardia (145 beats/min). Cutaneous symptoms were absent except for mild pruritus of the neck. Her blood pressure and percutaneous oxygen saturation (SpO2) levels were normal. She was treated with intravenous administration of 4 mg betamethasone and 5 mg chlorpheniramine, followed by an intramuscular injection of 0.3 mg adrenaline. Within 10 min, the patient's dyspnea and tachycardia subsided without sequelae. Further investigation with CD203c expression-based basophil activation test (BAT) to raspberry was negative. After avoiding raspberry and all the other berries, as well as still unchallenged walnuts, she has not experienced any episode of acute respiratory reactions for 3 years.

Raspberry (*Rubus idaeus*) is a small fruit belonging to the *Rosaceae* family: subfamily *Rosoideae* along with strawberry. To the best of our knowledge, there have been only five reported cases of hypersensitivity reactions related to raspberry including our case (Table 1).[1–4] Three cases had evidence of cross-reactivities with other fruits belonging to *Rosaceae* family, such as strawberry ($n=2$), and/or rPru p 3 ($n=2$) from peach.[2–4] Our case demonstrated negative results on the skin-prick test, which is reliable but not infallible, exhibiting an 85% sensitivity rate.[5] Despite a lack of cutaneous or mucosal involvement, our case demonstrated the acute onset of laryngeal involvement after exposure to a probable allergen and fulfilled one of the amended criteria for the diagnosis of anaphylaxis.[6] Anaphylaxis often involves isolated respiratory or cardiovascular symptoms.[7] In our case, the specific IgE to birch was negative, and no symptoms of tingling or edema of the oral mucosa were observed before the respiratory symptoms developed. Therefore, our case is more likely to be classified as class 1 food allergy, which is sensitized through the gastrointestinal tract, rather than classified as oral allergy syndrome.[8]

CONFLICT OF INTEREST STATEMENT

The authors declare no conflicts of interest.

ETHICS STATEMENT

Approval of the research protocol: No human participant was involved in this study.
Informed Consent: N/A.
Registry and the Registration No. of the study/trial: N/A.
Animal Studies: N/A.

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