



Letter to the Editor

Familial kiwi fruit allergy: A case report



Dear Editor

Kiwi fruit (*Actinidia deliciosa*) has been recognized as a food allergen for over 30 years.¹ Clinical information about kiwi fruit allergy is mostly based on several case report series. Kiwi allergy presents with a different range of symptoms from localized oral allergy syndrome, urticaria, angioedema, contact urticaria, rhinitis, conjunctivitis to life-threatening anaphylaxis.² In Lucas JSA et al. study,³ 65% of the patients with kiwi allergy reported localized oral allergy, and severe symptoms were reported by 18% of subjects. Kiwi allergy in this population was found to be associated with self-reported latex allergy (9%) and allergies to avocado (5%), banana (6%), apple (6%), grass pollen (29%) and tree pollen (23%). However, Aleman A et al. study was reported that 12% of the patients with kiwi allergy are mono-sensitized to kiwi, not sensitized to pollen, latex or any other fruits.⁴

Kiwi allergens have been recently identified and characterized.² However, several questions regarding kiwi allergy remain unknown such genetic factors do play an important role in kiwi allergy risk. Only few studies examined the heritability of food allergy and a family-based study by Tsai HJ et al., demonstrated strong familial aggregation of food allergy to most common food allergens such as sesame, peanut, wheat, milk, egg white, soy, walnut, shrimp, cod fish.⁵

Here, we present the case of a 31-year-old male with a family history of kiwi allergy (anaphylaxis) who complained of wheeze, larynx edema and hypotension immediately after ingestion of a cake with kiwi, pineapple, banana and strawberry. He had stayed at the emergency room for 2 h with a need of epinephrine. He had not experienced any reaction to any food before and this was the first episode occurred after ingestion of the cake. He was referred to our allergy outpatient clinic for an extensive diagnostic workup comprising a complete blood count, biochemistry, determination of serum specific immunoglobulins, skin prick tests with aeroallergens and food allergens, and prick to prick tests with kiwi, pine apple, banana, strawberry, peach, apple and kiwi. He had asthma for 20 years and he was not receiving any asthma drugs for 2 years. His mother and his brother had allergic rhinitis and a history of anaphylaxis with kiwi. He hasn't eaten kiwi fruit before and this was the first exposure of him to kiwi fruit. He was current-smoker with the smoking history of 5 pack/year. Physical examination was unremarkable, with stable vital signs, including heart rate of 80 beats/min (regular), respiration of 16 breaths/min (regular), and blood pressure of 130/80 mm Hg. Spirometric values were measured (Spirolab III MIR, Italy). FVC was

3.78 L (69% of predicted value). FEV₁ was 3.07 L (67% of predicted value). The FEV₁/FVC ratio was 77%. Reversibility test was positive. The results of the blood tests were all normal. Skin prick test was performed according to the American Academy of Allergy, Asthma and Immunology recommendations. Histamine and saline were used as positive and negative controls, respectively. Resulting wheals were measured after 15 min and mean wheal diameter ≥ 3 mm accepted as positive.⁶ Those of the prick tests with aeroallergens (Alyostal-France) were positive to *Dermatophagoides pteronyssinus* (mean wheal diameter = 6 mm), *Alternaria alternate* (3 mm), and *Aspergillus fumigatus* (3 mm). Skin prick test with food allergens such as wheat, egg white, egg yolk, banana, apple, milk, strawberry, hazelnut, peanut and peach all were negative. Pollen and latex allergy were not detected by skin prick tests. Prick to prick tests with banana, strawberry and pine apple were negative. Only prick to prick test with kiwi was positive (4 mm). Kiwi specific IgE was 0.41 kU/l which was measured by the immunoCAP technology (Pharmacia, Uppsala, Sweden). Kiwi fruit restriction in his diet and EpiPen[®] (epinephrine) Auto-Injector has been recommended. Asthma treatment has been started according to asthma symptom level.

Because the patient had a family allergy history with kiwi, diagnostic workup for his mother and brother also was made. They had both allergic rhinitis and history of anaphylaxis after eating of kiwi. His mother was 55 years old and she had experienced the reaction with kiwi when she was 40 years old. She was eating a little amount of kiwi and within a few minutes of eating the kiwi, she developed coughing, wheezing, dyspnea, and swelling in the throat. She did not experience any nausea, vomiting, diarrhea, syncope or loss of consciousness. She had not eaten the kiwi in the past, and a family member provided her with an antihistamine. She remembered that the reaction resolved within an hour without a need of epinephrine and emergency room visit. She had not been exposed to kiwi after that reaction. His brother was 21 years old and he reported a episode of anaphylaxis associated with the ingestion of kiwi when he was 15 years old. Coughing, wheezing, dyspnea, and swelling in the throat occurred after eating a little amount of kiwi. He had no loss of consciousness. He was brought to the emergency department and treated for anaphylaxis attack. Those reactions were occurred after the first exposure of kiwi fruit for the whole family. They had restricted their diet for kiwi fruit after the reaction and they had not any reaction with kiwi after first reaction. Prick tests with aeroallergens were positive to *D. pteronyssinus*, *A. alternate* and *A. fumigatus* for his mother and brother too. Pollen and latex allergy were negative. Prick to prick tests with kiwi was positive for his mother (5 mm) and his brother (3 mm). Specific IgE antibodies to kiwi were 1.89 kU/l and 0.69 kU/l for his mother and brother, respectively.

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After the diagnostic workup, we have seen that 3 members of the family had the same aeroallergen sensitization pattern and kiwi allergy. Certain atopic diseases that include asthma, allergic rhinitis, atopic dermatitis and food allergy aggregate within families. However, to the best of our knowledge, the kiwi allergy in 3 members of the same family has been reported firstly in the literature. Food allergy is defined as a subject who met the criteria described below: 1.) Clinical symptom criteria – a previous reaction to a food with report of clear and objective findings consisting of any one of the following symptoms: skin symptoms; respiratory tract symptoms; cardiovascular symptoms and gastrointestinal symptoms; 2.) Timing of symptoms within 2 h of ingestion; 3.) Specific IgE positivity or skin prick test reactivity to culprit food.⁷ Three members of the family had met all criteria and they were accepted as anaphylaxis due to kiwi fruit allergy.

Family based studies were generally used different statistical models based on histories of families with one parent and at least two or more biological children with one or more positive food allergy to estimate the inter-relationship of clinical food allergy and heritability among family members.⁵ We confirmed the history of kiwi fruit allergy with high kiwi specific Ig-E and kiwi prick to prick sensitivity among 3 family members. Like other allergic reactions, an anaphylactic reaction does not usually occur after the first exposure to an allergen. However, an anaphylactic reaction in this 3 members of the family was occurred after first exposure to kiwi fruit in adult age. There may be no sensitization to kiwi fruit before and genetic predisposition may increase the risk of anaphylaxis after first exposure to kiwi. We did not perform any HLA haplotypes or genetic test for the family members and no specific genetic factors have been identified for kiwi allergy which is the limitation. In addition to genetic contribution, shared environmental and lifestyle factors may also play a role in the observed familial aggregation of kiwi fruit allergy and kiwi-fruit-sensitization in the same family.

We conclude that a careful family history could give important diagnostic clues for the etiology of food allergy and anaphylaxis. Kiwi fruit allergy appears to be increasing in frequency. Clinical

features of allergy can occur in isolated allergy, with latex-fruit syndrome and fruit-pollinosis allergy. Genetic patterns of in each of these clinical groups may need evaluation in the future by the increasing prevalence of kiwi allergy.

Conflict of interest

The authors have no conflict of interest to declare.

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