

The Clinical Spectrum of Reactions Due to Banana Allergy

Muz Alerjisine Bağlı Olarak Gelişen Reaksiyonların Klinik Spektrumu

Abdullah Dayioğlu¹, Sena Akgiray¹, Hikmet Tekin Nacaroglu¹, Semiha Bahçeci Erdem²

¹Istanbul Medipol University Faculty of Medicine, Department of Pediatric Allergy and Immunology, Istanbul, Turkey

²Çiğli Regional Training and Research Hospital, Clinic of Pediatric Allergy and Immunology, Izmir, Turkey

Abstract

Allergic reactions to bananas have rarely been reported. The clinic reports mostly moderate local allergic reactions (Oral Allergy syndrome) to bananas, though some reports state reactions reaching anaphylaxis. We report three cases of banana allergy. The first case, immediately after giving a teaspoon of banana to a 7-month-old baby by the mother, he was admitted to the emergency department with the complaints of vomiting, urticaria, swelling of the mouth and eyes. The second case, after some banana yogurt was eaten by a 6.5-month-old baby, she presented with a rash which developed at the 3rd hour. In the third case, a 16-year-old male patient applied with itchy rashes on his body after eating a banana in 1-2 hours. Our cases are presented to emphasize that urticaria and anaphylaxis may occur due to banana allergy.

Keywords: Anaphylaxis, atopic dermatitis, banana allergy

Öz

Muz karşı alerjik reaksiyon nadir olarak raporlanmıştır. Muz alerjisinde klinik genellikle orta derecede lokal semptomlar (Oral Alerji sendromu) şeklinde bildirilmekte, ancak bazı raporlarda anafilaksiye kadar gidebilen şiddetli semptomlar da bildirilmiştir. Bu bildiriye muz alerjisi tanısı alan üç olgu sunulmuştur. İlk olgu 7 aylıkken annesinin 1 çay kaşığı muz yedirmesinden hemen sonra fıskırarak kusma, ürtiker, ağzı ve gözlerde şişlik şikayetiyle acile başvurdu. İkinci olgu 6,5 aylıkken yediği muzlu yoğurt sonrası 3. saatte gelişen döküntü şikayetiyle bize başvurdu. Üçüncü olgu olan 16 yaşındaki erkek hasta, muz yedikten 1-2 saat sonra vücutta kaşıntılı döküntüler ile başvurdu. Muz alerjisine bağlı ürtiker ve anafilaksi görülebileceğini vurgulamak için olgularımız sunulmuştur.

Anahtar kelimeler: Anafilaksi, atopik dermatit, muz alerjisi

Introduction

Food allergy is defined as an abnormal or exaggerated immune response to food proteins. It has been reported that 4-6% of the world's child population has food allergy (1). Responsible foods differ according to culture and population. While the most common food causing allergies in the United States pediatric population are cow's milk, eggs, peanuts, soy, wheat, fish and shellfish, peanuts, fish and shellfish are more common in adults (1). In a study conducted in the Black Sea region of Turkey, beef (31.8%), cow's milk (18.1%), cocoa (18.1%), eggs (13.6%), and kiwi (13.6%) were found to be among the most common food

allergens (2). In another study conducted in Turkey, eggs (57.8%), cow's milk (55.9%), nuts (21.9%), peanuts (11.7%), walnuts (7.6%), lentils (7.0%), wheat (5.7%) and cattle meat (5.7%) were found as other allergens (3).

Allergic reactions to bananas have rarely been reported. It has been shown in studies from different parts of the world that banana allergy is seen between 0.04% and 1.2% in the general population (4). Five allergens causing banana allergy have been identified. Mus a 1 profile, actin binding protein, weighing 14 kilodaltons, found in all eukaryotic cells; causes cross reaction with pollen and plants. Mus a 2 is a member of class 1 chitinase pathogen-associated



Address for Correspondence: Hikmet Tekin Nacaroglu, Istanbul Medipol University Faculty of Medicine, Department of Pediatric Allergy and Immunology, Istanbul, Turkey

E-mail: tekin212@gmail.com **ORCID ID:** orcid.org/0000-0003-1333-2648 **Received:** 24.04.2020 **Accepted:** 12.05.2020

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protein family 3. It causes skin test positivity in more than 50% of cases with banana allergy. In addition, plant-derived nutrient class 1 chitinase is the most important panallergen causing Latex-fruit syndrome. Mus a 3 (non-specific lipid transfer protein), Mus a 4 (thaumatin like protein) and Mus a 5 (β -1.3 glucanase) have been reported by the IUIS Allergen Nomenclature Sub committee in recent years (5,6).

The clinic reports mostly moderate local allergic reactions (Oral Allergy syndrome) to banana, though some reports state reactions reaching anaphylaxis (7). In this report, three cases with banana allergy with different clinical findings are presented.

Case Reports

The First Case

Seven-month-old patient was admitted to the emergency department with vomiting, widespread urticaria on face, swelling of the mouth and eyes. This was anaphylaxis and aggressive emergency management was done. Diagnostic tests revealed total IgE: 37 kU/L and banana-specific IgE: 8.7 kU/L. The symptoms of our patient, who had no health problem until 4 months of age, had immediately started with the contact with banana peel. Banana specific IgE: 2.4 kU/L was obtained and epidermal prick to prick test revealed 3x3 mm induration. Specific IgE levels for cross-reactive allergens were checked; kiwifruit: 0.165 kU/L, latex: 0.114 kU/L, strawberries: <0.10 kU/L, avocado: <0.10 kU/L. The results of the prick to prick test were as follows: positive control: 5x5 mm, banana: 3x3 mm positive, strawberry: 2x2 mm positive, avocado and latex were negative. No food provocation test was performed. Adrenaline autoinjector was prescribed and the patient was told to continue the elimination diet.

The Second Case

Six and a half month old patient applied to us with a rash developed three hours after eating banana yogurt. There was no drug intake before the onset of his/her complaints. She was the first child of unrelated parents and was born in normal vaginal route at the 40th gestational week, following a smooth pregnancy. She was diagnosed with atopic dermatitis due to a history of rashes starting at 2 months and 10 days of age. Formula milk was started in addition to breast milk because the breast milk was insufficient. At the 4 months of age, skin prick tests and specific IgE levels were all negative for cow's milk, egg and wheat. She was advised to continue moisturizing. It was reported that she

had previously consumed yogurt and had no symptoms. Banana prick to prick test was negative and banana specific IgE was 0.194 kU/L. In the food provocation test with banana yogurt, eczematous skin lesions were observed 4 hours later (Figure 1). A banana elimination diet was initiated and the patient was informed about cross reactions. At the last follow-up, the specific IgE results were as follows: banana: 0.597 kU/L, kiwi: <0.10 kU/L, latex: <0.10 kU/L, strawberries: <0.10 kU/L, avocado: <0.10 kU/L.

The Third Case

A 16-year-old male patient applied with itchy rashes on his body that developed after 1-2 hours of eating orange, pear and banana. Four years ago, he had symptoms of rash, facial swelling, dyspnea, cough, difficulty swallowing immediately after eating a cherry. He and his family did not have any history of additional allergic diseases such as asthma, rhinitis or eczema. In the skin prick to prick test, the diameters of induration were: Banana: 15 mm, pear 3 mm, orange 3 mm. (Figure 2). Epidermal prick to prick test was not performed because of the history of anaphylaxis with cherry. Latex and pollen sensitivities were not detected in the epidermal skin test. The patient did not accept oral food challenge test with banana, pear and orange. Due to a history of anaphylaxis with cherry, no food challenge with cherry was performed. Adrenaline autoinjector was prescribed and elimination diet was recommended. They were informed about cross reactions and called for follow-ups.



Figure 1. Exacerbation of eczema observed after oral food challenge in our second case



Figure 2. Prick to prick test with food in our third case

Discussion

Cow's milk and egg are the most common cause of food allergy in children in our country (3). Allergic reaction due to banana intake is a very rare food allergy. Banana allergy has been shown to be seen between 0.04% and 1.2% in studies all over the world (4). Rarely, anaphylaxis has been reported in banana allergy with especially oral-cutaneous involvement. Systemic reactions such as skin involvement, hypotension, angioedema, respiratory arrest have been reported as a symptom in patients with anaphylaxis (8-10).

In a male patient with a 4-month history of eczema, banana-related anaphylaxis was diagnosed with vomiting, urticarial and cyanosis symptoms 5 minutes after eating a banana. The authors reported that, in this case, the susceptibility to food antigens may be mediated by many ways, such as through the skin, by inhalation, through the gastrointestinal tract, through direct exposure or directly through breast milk. They also stated that exposure to fresh bananas may have increased the severity of symptoms, given that the major allergens of bananas may have heat sensitivities (9). Hauswirt and Burks (7) reported a case of anaphylaxis after banana ingestion and the patients' skin test was negative. The first case of anaphylaxis after banana ingestion is a 7-month-old patient with a diagnosis of atopic dermatitis and a history of anaphylaxis due to cow's milk. Urticaria, angioedema, vomiting, respiratory

symptoms started two hours after banana intake, and there was no history of reactions to latex and other foods that could cross-react with bananas. While the skin test performed with commercial solution was negative, 20x20 mm induration was detected in the prick to prick test with banana and the specific IgE value was 4.70 ku/L. To date, the positive predictive value for banana-specific IgE has not yet been described in the literature. In previously reported cases, specific IgE values of two cases with symptoms after banana intake were found to be 5.21 kU/L and 5.24 kU/L (11).

The specific IgE value of our first case was 8.7 kU/L, and 0.194 kU/L for the second case. The specific IgE test was not taken for the third case. Epidermal prick test was performed in two of our cases and susceptibility to banana was detected. In the second case, the oral food challenge test was positive. This shows us that the specific IgE value or skin tests alone are not significant, and in cases without contraindications, symptoms should be confirmed by oral food challenge tests. However, allergic reactions may occur during these tests. For this reason, they must be performed in experienced centers. In our first case, no food challenge was performed because of the patient's history of anaphylaxis. In our second case, eczema exacerbation was observed within 4 hours after oral provocation test with banana. The third case did not accept the food challenge test because he had already observed the rash every time he ate bananas, pears and oranges. Due to a history of anaphylaxis with cherry, no food challenge test was performed with cherry.

The first step in the management of allergic reactions due to bananas is the elimination of the allergen from the diet. In life threatening conditions such as anaphylaxis, intramuscular adrenaline must be used. Adrenaline auto-injector must be prescribed to the patients with a history of food anaphylaxis. The usage should be taught carefully. Elimination diet was suggested for our patients. Patients with history of anaphylaxis was prescribed adrenaline and the use of autoinjector was taught.

Besides being rarely seen, banana allergy is also known for causing Latex-fruit syndrome. The most common cross-reactivities of the banana allergy are kiwi, avocado, melon, pollen and latex. 20-60% of the patients were identified to have latex allergy, IgE mediated reactions caused by fruits. From oral allergy syndrome to severe anaphylaxis, we come across different presentations. Class 1 enzyme N-terminus hevein, responsible for the cross-reaction, was reported as the major latex allergen (6). In our cases, latex sensibility

was not observed in latex specific immunoglobulin results and epidermal prick tests.

As a result, besides being seen rare, banana allergy leads to both severe systemic reactions and Latex-fruit syndrome. Patients with a history of food anaphylaxis must definitely be prescribed an adrenaline auto injector. The usage must be taught and the families must be informed about how to carry the injector.

Ethics

Informed Consent: Informed consent was obtained from the patients.

Peer-review: Externally peer-reviewed.

Authorship Contributions

Concept: A.D., H.T.N., Design: A.D., H.T.N., Data Collection or Processing: A.D., H.T.N., S.G., S.B.E., Literature Search: A.D., H.T.N., S.G., S.B.E., Writing: A.D., H.T.N.

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