Introduction

It is estimated that 5% of young children are affected by food allergy with increasing prevalence. Food-induced allergic reactions account from diversity of symptoms and disorders including the skin, gastrointestinal and respiratory tracts which can be ascribed to IgE-mediated and non-IgE-mediated mechanisms (1). Foods have a pathogenic role in a subset of children with atopic dermatitis (AD) and asthma (1). Allergy to cow’s milk, eggs, and cereal is more widespread in atopic infants and younger children (2). However, it is considered that allergy to potato is uncommon in contrast to above-mentioned foods. As in Western countries, white potato (Solanum tuberosum) is a very common ingredient in the diet of Turkey. Its cooked form is introduced in the child’s diet generally around the age of 4 to 6 months as one of the first solids foods (3). In children, allergy to cooked form has been reported, including both immediate and late severe reactions, and even with anaphylaxis (3,4). In the literature, allergic reaction against to raw potato has been rarely reported in children as some is being immediate and others being late reactions, and it usually results from ingestion. Herein, we report two cases with a background of allergic diseases developed anaphylaxis one with cooked potato and the other one with raw potato.

Case report

Case 1

An 11-months old boy presented to our clinic with flushing and swelling at cheeks and lips, ocular itching and erythema, nasal itching, sneezing and cough. In his history, it was found that raw potato was given to alleviate discomfort during eruption; followed by allergic reaction against raw potato. It was also seen that the parents described presence of atopic derma-
family was counseled about potential allergic disorders such as pollen allergy, allergic rhinitis and asthma.

Case 2

A 3-years old boy presented to our clinic with cough, wheezing and dyspnea over 5-10 days of each month within previous year. It was found that the patient presented to emergency department in all episodes and received inhaler salbutamol therapy during these episodes. The parents described cough, abdominal pain and vomiting were developed after consumption of cooked potato for the first when he was one year old. It was found out that father and grandfather had asthma. No abnormal finding was detected in the physical examination. Laboratory test revealed absolute eosinophil count of 270/mm³, percent eosinophil of 4.5%, total IgE of 80 IU and serum potato specific IgE 125 kU/L. We applied a test panel with Aeroallergens and food allergens including: Dermatophagoides pteronyssinus, Dermatophagoides farinae, Alternaria alternata, cow’s milk, walnuts, hazelnuts, peanuts, sesame seeds, wheat, egg whites, tuna fish, soybean bean and histamine (10 mg/ml of histamine phosphate) as positive and 0.9% sterile saline as negative controls. Standardized extracts (Stallergenes; Antony, France) were used, and SPTs were evaluated 15 min after application and were considered positive if the mean wheal diameter was ≥ 3 mm compared with the negative control. As a result, we found SPT positivity against walnut 6 x 6 mm and egg white 8 x 7 mm. In prick-to-prick test using raw potato, the patient was found to be sensitive against raw potato 10 x 12 mm, histamine 5 x 6 mm (figure 1). In the provocation test using potato, flushing and induration was detected after contact of raw potato to lips (figure 2). Egg, walnut and raw potato was eliminated from his diet. No latex allergy was detected. The

Figure 1 - Positive results to raw potato (3) and positive control (histamine, 2) in prick by prick. The tests with latex (4) and physiologic saline (1) are negative.

Figure 2 - Positive raw potato challenge (labial and face edema, erythema).
An unexpected cause of anaphylaxis: potato

Discussion
The vast majority of anaphylaxis cases in children are related with food, especially cow milk and eggs. Although potato is widely consumed in our region as in Europe, adverse reactions to potato are unusual. Both cooked and raw form of potato can cause allergies. In adults, allergy to raw potato is generally considered as a manifestation of oral allergy syndrome in patients with pollen allergy. It is particularly observed in housewives, who experience itching, rhinoconjunctivitis, and, in some cases, asthma or even anaphylaxis during the peeling of potatoes (8). However, allergy to cooked potato have only been reported in children so far and it has been reported that allergy to cooked potato may involve both immediate and late severe reactions, and even anaphylaxis (3,4,9,10). Potato related anaphylaxis is rare. Monti et al. (11) reported an 8-month-old patient developing anaphylaxis with cooked potato, while Beausole et al. (12) described a 4-year-old patient developing anaphylaxis with raw potato. In the study by De Swert et al. (3) 36 cases with potato allergy were evaluated, three of which were admitted with clinical features of anaphylaxis. Symptoms of anaphylaxis were observed after contact to raw and cooked potato in our cases.

In a previous study declared that AD was the most common clinical feature present with potato allergy (3,9,13). De Swert et al. (5) evaluated children with potato allergy, all patients had atopic dermatitis. In another study by De Swert et al. (10) it was found that all subjects apart from one with potato allergy had eczema. In the study by Majamaa et al. (4) in which skin testing, oral challenge responses to potato and the occurrence of immunoglobulin E antibodies to patatin (Sol t 1) were evaluated in infants, it was found that all patients had atopic dermatitis. In another study, it was reported that there was AD in 33 of 40 patients.

Respiratory symptoms (wheeze / rhinitis) were the second most common symptom. Foods rarely cause respiratory symptoms. In the study by De Swert et al. (3) it was found that there was wheezing / rhinitis in 40% of those patients with potato allergy. A case report by Quirce et al. (8) reported two housewives in whom asthma findings developed after handling raw potato.

Thus far, five potato allergens have been defined; the glycoprotein “patatin” (Sol-t-1) is the most important of these that shows a significant homology with a latex allergen, leading to the possibility of cross-reaction (4,14,15). Patatin is considered to be a heat-labile allergen. In addition, 4 IgE-binding potato proteins (cathepsin D-, cysteine-, and aspartic protease inhibitors) were identified and designated as Sol t 2, Sol t 3.0101, Sol t 3.0102, and Sol t 4, belonging to the family of soybean trypsin inhibitors (Kunitz type) by Seppälä et al. (14). Although patatin is considered to be a heat-labile allergen, it has been shown that its IgE interaction is strongly influenced by other potato proteins in terms of heat lability (16). The development of symptoms in

Figure 3 - Positive results to raw potato (4), cooked potato (3) and positive control (histamine, 2) in prick by prick. The tests with latex (5) and physiologic saline (1) are negative.

Figure 4 - Positive raw potato challenge (labial edema, erythema and induration).
some patients with only raw potato or unprocessed potato or after oral intake, can be attributed to heat-labile potato proteins, which are unstable in the presence of digestive enzymes and gastric acid or lose their allergenic properties after cooking (3). Reaction with raw potato is observed in the presence of a reaction against patatin usually in the form of erythema and urticaria. There are different allergens expressing cross-reaction with potato. Potato is one of the foods implicated in the latex-fruit syndrome, and it has been questioned whether latex sensitization precedes or follows the onset of food allergy (14,15). Latex sensitivity was not detected in our patient. Others important allergens include birch pollen and grass pollen. In our patient, follow-up was scheduled for the development of seasonal allergic rhinitis and pollen sensitivity. Here, we aimed to emphasize potato allergy, a rare entity, and to remind potential disorders that could develop with or after potato allergy.

References