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Celery – cause of severe anaphylactic shock

Seler – przyczyną ciężkiego wstrząsu anafilaktycznego

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Summary

- Background:** We present a case of anaphylactic shock induced by celery ingestion in a 28-year old woman with pollinosis during allergen (50% birch, 50% grass) immunotherapy.
- Case Report:** A female patient, aged 28 was admitted to the clinic due to a serious anaphylactic reaction. The event took place 15 min after ingesting fresh celery. She recovered after routine treatment with adrenaline, corticosteroids and antazoline.
- Conclusions:** Our case shows the possibility of simultaneous occurrence of hypersensitivity to inhaled allergens and food. In such cases, it is considered part of cross-reactivity. We discuss the importance of cross-reactivity associated with sensitization to pollen and vegetable foods.
- Key words:** celery • anaphylactic shock • cross-reactivity

Streszczenie

- Przedstawiono przypadek 28-letniej pacjentki, u której wystąpił ciężki wstrząs anafilaktyczny po spożyciu surowego selera. Chora była w trakcie immunoterapii alergenowej (brzoza 50% i trawy 50%). Wstrząs wystąpił po 15 minutach po spożyciu selera. W terapii zastosowano adrenalinę, glikokortykosteroidy oraz antazolinę.
- Celem pracy jest zwrócenie uwagi na jednoczesne występowanie alergii wziewnej oraz pokarmowej. W tego typu przypadkach rozważany jest udział reakcji krzyżowych, których znaczenie jest omawiane w pracy.
- Słowa kluczowe:** seler • wstrząs anafilaktyczny • reakcje krzyżowe

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It is a problem – sighed the celery

J. Brzechwa

INTRODUCTION

Analysis of the incidence of severe anaphylactic reactions after foods shows that in the past two decades the incidence of food allergy has significantly increased [1]. The incidence of food hypersensitivity, allergic type, occurs in 2.4–4% of adults and in children ranges from 5–8% [5].

Celery (*Apium graveolens*), because of its taste and nutritional value, occupies an important position in the human diet. This vegetable contains twice as much vitamin C as citrus fruit and also contains vitamins B, PP, E and folic acid, as well as being a source of phosphorus, calcium, potassium and zinc [14]. However, in patients showing hypersensitivity, celery, like most vegetables and fruits, can cause symptoms. Particularly common celery can cause anaphylactic reactions in persons allergic to mugwort and birch pollen. It is estimated that as many as 71–95% of cases of pollinosis caused by birch show sensitivity for cellery [4].

Apium graveolens is one of the most important plant food allergen sources in the adult Central European. The most important celery allergens are PR-10 protein (Api g 1), non-specific lipid transfer proteins - LTP1 (Api g 2), profilin (Api g 4) and flavoprotein (Api g 5). Api g 2 and Api g 4 allergies are potentially dangerous for allergic individuals because these allergens may induce an anaphylactic reaction as a result of cross-reactions between foods and inhaled allergens [7].

CASE REPORT

A female patient, aged 28 was admitted to the Clinic of Department of Allergology, Clinical Immunology and Internal Diseases of the Collegium Medicum in Bydgoszcz due to a serious anaphylactic reaction after ingestion of raw celery. Originally there appeared abdominal pain located in the upper abdomen, generalized pruritic hives, swelling of the eyelids and lips, and general weakness and shortness of breath. These symptoms occurred about 15 minutes after ingestion of raw celery. In the physical examination, in addition to these abnormalities the following were observed: decrease in blood pressure to 60/40 mmHg, tachycardia (120/min.), tachypnoë (25 breaths/min.). The medical history taken from this patient revealed that for about three years the patient had had symptoms of seasonal allergic rhinitis, while after eating raw apples symptoms in the oral cavity, such as burning, and swelling of the lips and cheeks, typical allergy symptoms of the oral cavity (oral allergy syndrome, OAS). Until then, she had not consumed raw celery. The skin tests showed an allergy to tree pollen (birch, alder, hazel), grass, weeds, fungi, moulds and apple. For 4 months the patient had been given Phostal® (Stallergen) desensitization vaccine (50% birch, 50% grass), the last dose of vaccine having been given 14 days before the onset of acute anaphylactic reaction.

Laboratory tests using Pharmacia UniCAP showed an elevated total IgE value of 287.27 IU/ml, while specific IgE against antigens of celery was 0.70 kU/l (class I), mixed

early grasses 3.70 kU/l (class III), a mix of early trees, 1,20 kU/l (class II). A complete blood count revealed peripheral blood leukopenia (2.34 G/l), and a slight increase in the concentration of C-reactive protein (1.72 mg/l). The study showed β tryptase concentration of 18,6 μ g/l.

Treatment consisted of epinephrine 1 mg im, dexamethasone 16 mg im, antazoline 100 mg im, and 0.9% NaCl 500 ml. After this treatment normal blood pressure returned, shortness of breath was relieved and the patient felt better. After 24 hours the described skin lesions cleared.

DISCUSSION

Epidemiological studies on the incidence of allergic hypersensitivity to birch pollen (*Betula verrucosa*) showed that this kind of pollinosis is the most common in Scandinavia, northern Russia and in Central Europe [9]. Birch pollen, after grass pollen, is the most common cause of pollinosis in Poland. The largest concentration of birch pollen is found in March–April [13]. A specific aspect of allergy to birch pollen is cross-reactions with other plants. According to Neudecker [11] the incidence of such reactions with birch pollen ranges from 50–93%. Since the description in 1948 of the first case of disease symptoms in the gastrointestinal tract in a child sensitized to tree pollens, research has been ongoing to explain this phenomenon. There is a hypothesis which suggests the participation of lectins in this type of reaction, because of the occurrence of this type of particles in both pollen and fruits and vegetables [17]. Rougé et al. [15] believe that lectin has the ability to connect to the IgE molecule and thus may trigger the release of histamine from mast cells. More convincing, however, are numerous studies discussing the importance of cross-reactions in the presence of symptoms of the gastrointestinal tract in patients with pollinosis [3].

There are suggestions that a more than 70%-similarity of proteins present in pollen and foods causes the cross-reactivity. Although in the case of the birch allergen Bet v 1 and Api g 1 of celery there is only 40% amino acid sequence similarity, there nevertheless occur cross-reactions and symptoms in the gastrointestinal tract in patients suffering from pollinosis [6]. The presented case shows that such reactions can even lead to the occurrence of dangerous anaphylaxis. Cross-reactions may occur not only between birch and celery allergens, but between birch pollen and apple, birch-mugwort and celery, or birch-plantain and celery [10]. In connection with this, the groupings of birch-apple, birch-celery, birch-mugwort-celery and finally birch-plantain-celery have been described [8]. A thorough analysis of the co-occurrence of food allergies and inhalation allergies revealed a large number of foods that can cause cross-reactions with pollen [11, 12]. Therefore, Yagami [17] proposed to identify such reactions as pollen-food syndrome – PFS). The PFS would include OAS and severe anaphylactic reactions, as well.

Diagnosis of this case once again proves that taking a medical history plays an important role in the diagnosis of allergy. Virtually immediate symptoms in the circulatory and respiratory systems were indicators of the onset anaphylactic shock. The performed laboratory tests, and especially β tryptase levels, confirmed an acute anaphylactic reaction

[16]. The development of the early-phase response is associated with immediate degranulation of mast cells. In addition to histamine and other mediators, tryptase is also released from mast cells. According to Arnold and Williams [2] elevated levels of this enzyme protein are a good marker of acute anaphylactic reaction.

Analyzing this case, the question arises whether there is an association between the occurrence of anaphylaxis and the conducted allergen immunotherapy. However, the interval which occurred between the last dose of allergen immunotherapy, and the incident of shock is likely to exclude a causal relationship.

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