

Anaphylaxis due to carrot as hidden food allergen

M. Schiappoli, G. Senna, A. Dama, P. Bonadonna, M. Crivellaro and G. Passalacqua^a

Allergy Service, Verona General Hospital, Verona. ^aAllergy & Respiratory Diseases, Dept of Internal Medicine, University of Genoa, Italy.

SUMMARY

Carrot is frequently involved in food allergies and oral allergy syndromes, usually in association with other foods. Nevertheless, carrot alone is rarely responsible for severe systemic reactions. We report a case of anaphylactic shock due to the inadvertent ingestion of carrot as a hidden allergen contained in an ice-cream. The etiological role of carrot in provoking the symptoms was thoroughly ascertained through appropriate *in vivo* and *in vitro* assays and by excluding, through double-blind placebo-controlled challenge, the involvement of other ingredients of the food.

We highlight once again the harm and risks due to hidden food allergens contained in commercial preparations and the importance of thorough patient education and information.

Key words: Carrot. Hidden allergens. Anaphylaxis.

Carrot is frequently responsible for oral allergy syndrome in pollinosis subjects (especially in birch pollenosis) (1, 2) or for food allergies although only exceptionally it provokes by itself severe or life-threatening reactions. We describe herein a case of carrot-induced anaphylaxis, due to the ingestion of this vegetable, included as hidden allergen in an ice-cream

A 29-year old man had a clinical history of seasonal allergic rhinitis due to birch pollen, lasting about ten years, for which he was treated with symptomatic drugs (antihistamines and nasal corticosteroids) only during each pollen season. One year before, he had experienced a life-threatening reaction after eating an appetizer containing carrot, fennel and celery: few minutes after the ingestion, facial angioedema dyspnea

and syncope occurred. The episode resolved spontaneously in about 1 hour. Noteworthy, the patient had never suffered from adverse reactions to foods before. Skin prick (SP), prick by prick (PP) and specific IgE assay (CAP System, Pharmacia, Uppsala, Sweden) were performed, showing a strong sensitization to carrot and celery. For both vegetable the wheal diameters (mean of the major diameter plus its orthogonal) at SP and PP were 8.5 mm and 12 mm respectively, and the CAP assay was class 4. Due to the severity of the reaction occurred and the positivity of the tests, we did not perform an oral challenge for ethical reasons. The patient was informed in detail and warmly recommended to avoid both vegetables and to carry with him an emergency kit.

One year later the first episode, few minutes after eating a commercial chocolate ice cream, anaphylaxis symptoms with profound hypotension rapidly developed. The patient was treated at the emergency care unit with intravenous epinephrine, corticosteroids and antihistamines and recovered within 2 hours. The serum tryptase level was 18 mcg/L (threshold 3.5 mcg/L), thus confirming the massive mast-cell degranulation. Skin test, prick by prick and IgE assay confirmed the previous demonstrated sensitizations to fennel and carrot, but the patient denied to have ate those vegetables. By carefully reading the list of the ingredients of the commercial ice cream, we discovered that carrot juice was used for preparing it. On the other hand, the challenges performed with other ingredients of the ice cream were negative. Also the additives E410 and E 407 were tested in an oral challenge at a cumulative dose of 100 mg and 30 mg respectively, with negative result.

COMMENTS

Carrot is a widely used vegetable and it is often involved in food allergy, in association with other vegetables and fruits, or it is one of the allergens intervening in complex inhalant-food syndromes, such as the so-called celery-mugwort-carrot syndrome (3). The major allergen of carrot is Dau c 1 (4), whereas Cyclophilin and the isoflavonoid reductase are thought to be the cross-reacting antigens (5). In the majority of cases, carrot is never the single allergen responsible for clinical manifestations, and anaphylaxis due to carrot have been reported only exceptionally (6, 7). On the other hand, carrot is widely used as a dye in food industries for the preparation of sauces, cakes, pastries, ice creams and ice-lolly. We highlight therefore the risk of allergic reactions in carrot allergic patients, following the ingestion of this allergen, even as hidden food. Early diagnosis followed by education on avoidance and treatment measures, including self-administered epinephrine, is mandatory in such patients.

RESUMEN

La zanahoria suele estar implicada en reacciones alérgicas alimentarias y síndromes alérgicos orales, habitualmente en asociación con otros alimentos. No obstante, rara vez la zanahoria sola es responsable de reacciones generales graves. Describimos un caso de shock anafiláctico por la ingestión accidental de zanahoria como alérgeno oculto en un helado. El papel etiológico de la zanahoria en la inducción de los síntomas se averiguó minuciosamente mediante análisis apropiados *in vivo* e *in vitro* y excluyendo, por medio de una prueba de provocación doble ciega y

controlada con placebo, la implicación de otros ingredientes del producto.

Subrayamos una vez más el peligro y los riesgos de los alérgenos alimentarios ocultos contenidos en preparados comerciales y la importancia de educar e informar exhaustivamente a los pacientes.

Palabras clave: Zanahoria. Alérgenos ocultos. Anafilaxia.

Correspondence:

Dr. Giovanni Passalacqua, MD
Allergy and Respiratory Diseases - DIMI
Padiglione Maragliano
Largo R.Benzi 10, 16132 Genoa - Italy
Phone + 39 010 3538908. Fax + 39 010 3538904
E-mail: gpass@smartino.ge.it

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