

Fait clinique

## Allergy to artichoke: a case report

### L'allergie à l'artichaut : un cas clinique

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#### Abstract

Epidemiology of food allergy is currently the focus of considerable research interest. Recognition of novel or regionally-important food allergens appears to be a priority. Here we report on a case of anaphylaxis occurred upon unintentional ingestion of artichoke (*Cynara scolymus*), an edible plant of the Compositae family. The presence of specific IgE was investigated by skin prick tests and RAST. In accordance with a convincing clinical history of artichoke-related anaphylaxis, skin prick tests revealed sensitization to artichoke, chicory and endive (also alimentary plants of the Compositae family), along with multiple food allergen sensitizations. Sensitization to all tested Compositae pollen allergens was also demonstrated. Allergy to artichoke has been considered rare. This report suggests that this typical Mediterranean vegetable may be an unrecognized cause of food allergy, particularly in individuals with multiple food and pollen sensitizations.

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#### Résumé

L'épidémiologie des allergies aux aliments est à présent l'objet de recherches considérables. La reconnaissance d'allergènes alimentaires nouveaux ou importants au niveau régional est certainement une priorité. Nous avons ici présenté un cas d'anaphylaxie qui s'est vérifié après l'ingestion involontaire d'artichaut (*Cynara scolymus*), une plante comestible de la famille des Compositae. La présence de IgE spécifique a été examinée par prick tests cutanés et par le RAST. Suivant une histoire clinique très persuasive, les prick tests ont révélé une sensibilité à l'artichaut, à la chicorée et à l'endive (plantes de la famille des Compositae), avec plusieurs sensibilités aux allergènes alimentaires. La sensibilité à tous les allergènes testés de pollens des Compositae a été démontrée. L'allergie à l'artichaut est considérée rare. Ce rapport suggère que ce produit végétal typiquement méditerranéen peut être une cause non identifiée d'allergie alimentaire, surtout dans le cas de sujets ayant plusieurs sensibilités aux aliments et aux pollens.

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#### 1. Introduction

Epidemiology of food allergy is currently the focus of considerable research interest, as epitomized, among other

initiatives, by the inclusion of this topic in the list of the thematic areas opened for research funding within the Sixth Framework Programme of the European Union [1]. Thus, recognition of novel or so far overlooked food allergens is increasingly considered a priority. Also important appears the characterization of specific food allergy profiles relevant to homogeneous geographic areas with distinct alimentary habits, such as the Mediterranean area (with its highly valued Mediterranean diet).

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Artichoke (*Cynara scolymus*), an edible plant of the Compositae family, is a typical Mediterranean vegetable. Italy, with an approximately 400–500,000 metric ton production, contributes the 40–50% of the global annual harvest; whereas California provides the near totality of the North-America artichoke crop.

In spite of a probably not negligible consumption, at least in Mediterranean countries, only two cases of adverse reactions elicited by eating artichoke have been reported [2,3]. In other cases, handling freshly harvested artichokes caused occupational allergy [4,5]. Here we report on a case of food allergy due artichoke and resulting in severe anaphylaxis.

## 2. Case report

A 17-year-old girl, approximately 1 h after eating marinated artichoke (a modest quantity garnishing a *Capricciosa* pizza), underwent severe anaphylaxis, characterized by generalized urticaria with lip and eyelid angioedema and dyspnea. The attack, which occurred in concomitance with moderate physic exercise (dancing), was treated in the emergency department with infusion of parenteral corticosteroids and antihistamines. Urticaria and dyspnea receded in about 2 h, while the lip and eyelid angioedema lasted for 1 day. Notably, the patient stated that she accurately avoided eating artichoke (she disliked it) and that, on that occasion, she had eaten it only because it was disguised as pizza garnish. The patient denied a family history of allergic diseases but mentioned having undergone another rather severe episode of urticaria and angioedema when she was 14, upon consumption of lentils. Also on that occasion she had received medication in the emergency department. Moreover, she cited several mild episodes of urticaria, which followed ingestion of peanuts and hazelnuts and were treated with oral antihistamines. All other foods were tolerated, including lettuce, endive, and chicory (vegetables also belonging to the Compositae family). In fact, she mentioned eating these vegetables from time to time, although she was not particularly keen on them. Moreover, she tolerated apple, peach and strawberries, which she ate frequently. Finally, the patient denied respiratory allergy symptoms at any time in her life.

## 3. Materials and methods

Skin prick tests were performed by prick-by-prick technique with fresh and boiled artichoke, endive, and chicory. Moreover, commercial food extracts (Lofarma, Milan and Stallergenes, Saronno, Italy) and airborne allergen extracts (ALK-Abelló, Lainate, Italy) were tested. A wheal of at least 3 mm in diameter (average) greater than the negative control was considered as a positive result.

Total and specific serum IgE were investigated by UniCAP reagents by Pharmacia and Upjohn, Milan. Values of specific IgE >0.35 kU/l were considered as positive RAST results.

## 4. Results

The patient (symptom-free at examination) was subjected to skin prick tests performed with the prick-by-prick technique for artichoke and other edible vegetables belonging to the Compositae family. The tests yielded positive results (Table 1). Notably, fresh vegetables consistently elicited wheals with larger diameters in comparison with boiled vegetables. Moreover, the tests performed with commercial extracts revealed multiple sensitizations to food allergens, particularly: legumes (beans, 5 mm; peas, 4 mm; peanuts, 4 mm; and soybeans, 5.5 mm); nuts (hazelnuts, 15 mm; and walnuts, 5 mm); cereals (rice, 5.5 mm; and wheat, 5 mm); and foods of the Rosaceae family (almonds, 5 mm; and peach, 4.5 mm). Furthermore, the presence of sensitizations to airborne allergens was studied, revealing positive responses to: *Artemisia vulgaris* (8.5 mm); *Quercus ilex* (4.5 mm); *Dermatophagoides pteronyssinus* (4 mm); and *D. farinae* (4 mm). The test for birch pollen proved negative.

When serum IgE were examined, a total IgE value of 171 kU/l (normal value ≤100 kU/l) and specific IgE directed against several food allergens were detected. Positive RAST results included: lettuce (*Lactuca sativa*; 7.2 kU/l); lentils (6.4 kU/l); peas (2.2 kU/l); peanuts (10.6 kU/l); soybeans (2.4 kU/l); hazelnuts (5.5 kU/l); walnuts (14.1 kU/l); brown rice (1.7 kU/l); wheat (0.9 kU/l); celery (0.6 kU/l); fennel (5.4 kU/l); tomatoes (3.6 kU/l); apple (33.1 kU/l); peach (40.8 kU/l); strawberries (13.4 kU/l); grapes (10.3 kU/l); and honey (0.4 kU/l). Almonds and beans tested negative as did bananas, melon and carrots. RAST for *C. scolymus* could not be performed, due to unavailability of the relevant commercial extract. As regards pollen allergens, specific IgE were detected for all the Compositae species tested: *A. vulgaris* (4.6 kU/l); *A. absinthium* (6.3 kU/l); *Ambrosia elatior* (0.8 kU/l); *Chrysanthemum leucanthemum* (5.34 kU/l); *Taraxacum vulgare* (1.8 kU/l); *Helianthus annuus* (0.7 kU/l); and *Matricaria chamomilla* (3.4 kU/l). In contrast, other pollen allergens, such as *Lolium perenne*, *Parietaria judaica*, *Cupressus sempervirens*, and *Olea europaea* tested negative, whereas house dust mites gave borderline responses.

## 5. Discussion

Food allergy due to artichoke has been considered rare. The only two cases reported in the literature both occurred in Mediterranean countries: one in Italy [2] and the other in

Table 1  
Mean diameters (mm) of wheals obtained by prick-by-prick skin testing with various edible Compositae. Histamine hydrochloride (10 mg/ml) = 7 mm

|           | Raw | Boiled |
|-----------|-----|--------|
| Artichoke | 8   | 6      |
| Chicory   | 10  | 8      |
| Endive    | 18  | 8      |

Israel (the latter characterized by acute edema of the tongue with life-threatening airway obstruction) [3]. The case reported here was also characterized by the severity of symptoms (anaphylaxis), putatively elicited by the accidental ingestion of small amounts of artichoke (which the patient had excluded from her diet). This conclusion was corroborated by the positive responses of the skin prick tests performed with fresh and boiled artichoke. Notably, the patient exhibited multiple skin and RAST positive responses to food allergens, including other vegetables belonging to the Compositae family, such as chicory, endive, and lettuce. However, she ate these Compositae vegetables occasionally, without consequences. Likewise, she ate apples, peach, and strawberries regularly, in spite of her high values of IgE specific for these Rosaceae fruits. The substantial degree of sensitization to virtually all Compositae pollen allergens further supported the diagnosis of artichoke allergy, suggesting the existence of cross-reacting allergenic epitopes shared by pollen grain proteins and plant tissue proteins, within the Compositae family. The absence of conjunctival or respiratory symptoms attributable to Compositae pollen can be perhaps explained with the fact that Compositae airborne pollen is found in scarce amounts in the atmosphere of the area where the patient lives (i.e. the area of Bari, Southeastern Italy; unpublished observations). Taken together, the information con-

tained in this report adds perhaps to the notion that allergy to plant-derived foods often occurs in individuals with multiple food and pollen sensitizations and that considerable discrepancy may sometimes exist between laboratory evidence and clinical findings.

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