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Oral Allergy Syndrome Associated with Jicama

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Abstract

Background: The occurrence of oral symptoms after food consumption defines oral allergy syndrome (OAS). Thus, our objective was to report the association of oral allergy syndrome triggered by jicama.

Methods: In this study, we report 10 cases of OAS associated with jicama eating.

Results: Of the total cases, 6 were women; the mean age of the group was 28.3 ± 11.4 years. All patients suffered from allergic rhinitis and 3 of them also had asthma. On average, patients experienced the onset of symptoms 5 minutes after eating jicama. As expected, the patients had oral ailments, mainly itching in the pharynx, palate, and lips; furthermore, 4 out of 10 also had skin symptoms. The skin test by the prick-prick technique with fresh jicama had a mean diameter of 8.1 ± 5.4 mm.

Conclusion: In closing, jicama should be considered as a cause of OAS, especially in regions where it is cultivated and eaten in large quantities.

Keywords: Food Hypersensitivity, Pachyrizus, Jicama

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Introduction

In Mexico, the prevalence of oral allergy syndrome (OAS) in an unselected population has been estimated to be approximately 5% (1). The primary symptoms associated with OAS are palatine and labial itchiness, an oral burning sensation, as well as edema of lips, and paresthesia, among others (2).

The name jicama is derived from Nahuatl, xicamatl, which means "watery root," since 90% of it is water. The legume *Pachyrhizu serosus*, commonly known as jicama, is originally from Mexico and Central America (3). Its main proteins are albumin, globulin, and prolamins (4). The macronutrients absorbed through 100 grams of the raw root are proteins 1.3 g, lipids 0.2 g, and carbohydrates 9.9 g (primarily inulin) (3). The seeds of the *Pachyrhizus* species contain rotenone, a toxic isoflavone (5).

The foods that have been most frequently associated with the presence of OAS are fruits and vegetables, primarily those that belong to the following genus: *Rosaceae*, (peach, pear, or apple), *Musaceae* (banana), or *Actinidaceae* (Kiwi) (6).

To our knowledge, this is the first report pertaining to the association of oral allergy syndrome triggered by jicama.

Methods

We evaluated a series of 10 cases of patients with OAS associated to jicama; all patients were 18 years or older. We came into contact with these patients when they received first-time allergy treatment at Dr Juan I. Menchaca Civil Hospital of Guadalajara.

↑What is "already known" in this topic:
The main symptoms associated with SAO are well known, as well as the most common foods associated with these symptoms.

→What this article adds:
Jicama is a food that has been poorly described in the context of SAO. This will be the first report on the association of oral allergy syndrome triggered by jicama.

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We utilized skin-prick tests to observe potential reactions to a selection of aeroallergens and foods. The aeroallergens were not standardized, and glycerinated at 1:20 weight/volume concentration (Allerquim). Histamine and glycerin were used as positive and negative controls, respectively.

We placed the allergens over each patient's volar forearm surface and used a standardized lancet (Hollister-Stier®) to puncture the skin; the interpretation was made following international guidelines (7). To determine allergy sensitization to jicama and other triggering foods, we used the prick-by-prick technique. The pulp of the jicama or the food involved was used for this purpose.

All tests were performed and interpreted by the same allergy specialist.

Continuous variables were expressed as means and standard deviations or as medians and percentiles or as proportions in the case of categorical variables. To process the data, we used IBM SPSS Statistics 20 (IBM Corp).

Each patient signed 3 consent forms: one expressed the patient's desire to undergo the regional aeroallergen skin tests; the second allowed us to carry out skin tests with the prick-by-prick technique, which tested jicama and other triggering foods; and in the third, the patient approved the use of their clinical information for scientific purposes. All patients were informed that they could withdraw from our study; furthermore, the anonymity of our patients was carefully guarded.

Results

From April 2017 to July 2019, 10 patients were diagnosed with OAS associated with jicama; 6 were women. The mean age of the group was 28.3 ± 11.4 years. Also, 100% of the patients had allergic rhinitis and 30% had asthma. On average, the patients experienced the onset of symptoms 5 minutes after having ingested jicama; these symptoms persisted for an average of 34 minutes.

Table 1. Characteristics of patients with oral allergy syndrome associated to jicama

	Patient									
Characteristic	1	2	3	4	5	6	7	8	9	10
Age, years	23	18	16	20	23	30	36	55	32	30
Sex	F	M	F	M	F	F	M	F	F	M
Allergic diseases										
Allergic rhinitis	+	+	+	+	+	+	+	+	+	+
Asthma	-	-	+	+	-	-	-	+	-	-
Atopic dermatitis	+	-	-	-	-	-	-	-	-	-
Sensitization to aeroallergen										
House dust mite	-	-	-	+	-	-	-	+	+	-
Epithelial	+	+	-	+	-	+	-	+	-	-
Trees	+	+	+	+	+	-	+	+	+	+
Weeds	+	+	+	+	+	+	+	-	+	+
Grasses	-	+	+	+	-	+	+	+	+	-
Fungi	-	-	-	+	-	+	-	-	-	-
Sensitization to food	Soy Carrot	Almond Soy Carrot Tomato	Almond Strawberry Melon Pecan Papaya Pineapple Banana Soy Tomato Carrot	Almond Soy	Almond Peach Pecan Pineapple	Almond Peanut Peach Strawberry Melon Soy	Strawberry Soy Carrot	Shrimp	Almond Soy Carrot	Almond Peanut Soy Carrot
Skin prick-by-prick to fresh jicama, mm	20	5	13	10	6	5	4	10	4	6
Onset of symptoms after eating jicama, minutes	3	1	5	10	1	1	2	3	1	20
Length of symptoms after eating jicama, minutes	60	5	30	15	1	15	30	120	15	45
Oral allergy syndrome associated with other foods		Almond Carrot Pecan	Apple Orange Banana Strawberry	Watermelon Cucumber Banana	Apple Orange Peach Pear Strawberry	Watermelon Peach Plum Pear Carrot Almond Peanut Grape	Blackberry Celery Alfalfa		Carrot	

F: Female; M: Male

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With regard to the jicama prick-by-prick test, the average size of the papule was 8.1 ± 5.4 mm. The aeroallergens that came from trees caused the most frequent sensitization among patients with OAS triggered by jicama; these trees were primarily mesquite, ash, and oak, followed by weeds (90%), such as *Ricinus communis* and *Ambrosia elatior*; grasses (70%) such as *Cynodon dactilon* y *Lolium perenne*; fungi were the least common (20%).

As expected, all of the patients manifested oral symptoms, primarily itchiness in the pharynx and the palate, as well as itchiness on the lips. As far as extra-oral symptoms, skin-related reactions were the most prevalent (40%), primarily bodily itching. Respiratory symptoms (30%) included difficulty breathing and pharynx tightness.

Table 1 displays the individual characteristics of patients with OAS triggered by jicama. All patients showed allergic sensitization to foods, but only 5 of them expressed symptoms with at least some of the sensitizing foods. Notably, 8 out of 10 patients were sensitized to soy, 7 to almonds, and 5 to carrots. Patients also experienced oral symptoms triggered by foods other than jicama as follows: symptoms to 8 foods (n = 1 patient), symptoms to 5 foods (n = 1), 4 foods (n = 1), 3 foods (n = 3), and 1 patient to only one food; there were 3 patients in which OAS was caused exclusively by jicama. Since jicama is not consumed cooked in our population, only skin tests were performed on the raw food.

Discussion

To our knowledge, this is the first time that a series of cases of OAS caused by jicama has been reported anywhere in the world, although this is the second instance in which such a specific association is documented; notably, the first recorded case (8) only mentions its occurrence without going into further detail. Epidemiological studies in Mexico have not yielded any evidence that associates the intake of jicama to OAS. During one of these Mexican studies, 1126 individuals were interviewed while they were in a recreational public space. They were asked questions regarding their food intake; overall, they recorded 70 cases of OAS, however, none resulted from jicama.[1] Interestingly, in a selected pool, there were 2 cases of OAS that were linked to jicama (n = 44), however, this study does not provide any additional information for either case.[6] Further research in several databases failed to provide any recorded cases linking OAS because of jicama ingestion.

Thus far, no one has been able to identify allergens in jicama that can explain OAS symptoms; however, as jicama is related to the soy and the peanut plant, from a taxonomical point of view, they all belong to the Fabaceae family and the Faboideae subfamily (9), which could be the cause of overlapping allergen reactions, and that might explain these reactions; nevertheless, our findings from this case study do not support this hypothesis, as specific IgE skin-prick and serum tests directed at peanut and soy came back negative.

Conclusion

In closing, jicama should be considered a food that causes OAS, especially within the regions where it is cultivated and consumed in high quantities. At this point, it is necessary to perform further studies that would allow us to identify allergens in jicama.

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Conflict of Interests

The authors declare that they have no competing interests.

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