

Labiatae allergy: systemic reactions due to ingestion of oregano and thyme

Manuel Benito, MD; Gemma Jorro, MD; Celia Morales, MD; Antonio Peláez, MD; and Agustín Fernández, MD

Background: There are no cases described in the medical literature of systemic allergic reactions due to oregano (*Origanum vulgare*) or thyme (*Thymus vulgaris*). These herbs belong to the Lamiaceae (Labiatae) family which comprises other plants such as hyssop (*Hyssopus officinalis*), basil (*Ocimum basilicum*), marjoram (*Origanum majorana*), mint (*Mentha piperita*), sage (*Salvia officinalis*) and lavender (*Lavandula officinalis*).

Objective: We describe three systemic allergic reactions caused by oregano and thyme in the same patient.

Methods: Skin tests with inhalant allergens and plants of the Labiatae family were done. We used the prick by prick technique with dried commercial plants and prick tests with extracts prepared with the Frugoni method in our patient and in ten control patients. Total serum IgE was determined by Phadezym IgE PRIST (Pharmacia). Specific IgE was measured by two methods: CAP system (Pharmacia) and Phadezym RAST (Pharmacia Diagnostics, Uppsala, Sweden) with activated discs of the allergenic extracts that were prepared in our laboratory.

Results: Skin tests with inhalants were positive to grasses. Skin tests with plants of the Labiatae family were positive in all cases when the skin prick technique was used; tests were negative with basil and lavender, and positive with all the others when we used the prick by prick technique. We did not detect any positive skin tests nor specific IgE to plants of the Labiatae family in control patients. Total serum IgE was 406 U/mL. Specific IgE was detected to all herbs tested; higher levels were obtained with the CAP system.

Conclusions: Plants belonging to the Labiatae family seem to show cross-sensitivity on the basis of clinical history and in vitro and in vivo test results.

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INTRODUCTION

Although herbs such as oregano and thyme are frequently consumed in many foods as seasonings, there are no references to allergic reactions due to these plants. We describe one case of systemic allergic reaction in a patient following the ingestion of foods seasoned on one occasion with oregano and on two occasions with thyme. Oregano (*Origanum vulgare*) and thyme (*Thymus vulgaris*) belong to the Labiatae family, which includes hyssop (*Hyssopus officinalis*), basil (*Ocimum basilicum*), marjoram

(*Origanum majorana*), mint (*Mentha piperita*), sage (*Salvia officinalis*), and lavender (*Lavandula officinalis*).^{1,2} These herbs are aromatic vegetable substances used for seasoning, as medical plants, or in perfumes.^{2,3}

References to allergic reactions due to herbs mention other plants belonging to different families and their cross-sensitivity with other plant species. Some authors described specific IgE against Labiatae (basil, thyme, oregano) in patients sensitized to birch pollen and celery, but these studies were based on in vitro tests and not on clinical manifestations.^{4–6}

CASE HISTORY

A 45-year-old man was seen because of three reactions related to the ingestion

of food. He had pruritus and swelling of the lips and tongue, dysphagia, dysphonia, and progressive upper respiratory difficulty as well as intense facial and palpebral edema. On two occasions he also had hypotension (second and third episodes: 60/30 mmHg; 60/35 mmHg), vomiting, and nausea. All three episodes occurred within a few minutes after the ingestion of pizza that contained cheese, tomato, and oregano (first episode); meat seasoned with thyme (second episode), and snails seasoned with thyme (third episode). He subsequently tolerated these foods without the herbs. The symptoms remitted after receiving epinephrine, corticosteroids, antihistamines, and fluid therapy in the emergency care unit. He had a personal history of IgE-dependent rhinitis and asthma since 20 years of age (sensitization to grasses).

MATERIAL AND METHODS

Skin Tests

The patient was tested with a series of aeroallergens commonly encountered in our environment (mites, epithelium, molds, and pollens). He was also tested with oregano, thyme and some plants of the Labiatae family (basil, lavender, hyssop, marjoram, mint, and sage). We performed tests by the prick by prick technique with a sample of the dried commercial plants previously moistened in distilled water,⁷ and prick tests were done with extracts prepared by the Frugoni method. Briefly, 5-g doses of powdered herbs were extracted for 60 minutes in 45 mL of Frugoni solution (12.5 mL of 96° alcohol and 100 mL distilled water). The solutions were centrifugated twice at 50,000 *g*. The supernatants were then dialyzed against a 50-fold volume of physio-

Servicio de Alergia, Hospital Clinic Universitario, 46010, Valencia, Spain.

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logic solution. Finally the extracts were filtered for sterilization with a Millipore 0.2 μ m filter and were freeze-dried and stored at 5°C.

Physiologic saline solution was used as a negative control and histamine, 10 mg/mL, as a positive control.

Skin tests for these herbs were also performed on ten control patients (five healthy and five atopic, sensitized to grasses). The reactions were graded from 1+ to 4+ according to the recommendations of the Northern Society of Allergology.⁸ Reactions of $\geq 2+$ were considered positive.

In Vitro Tests

Further studies included a blood count; blood glucose; renal and hepatic function tests; and IgG, IgM, and IgA concentrations (nephelometry). Total serum IgE was determined by Phadezym IgE-Prist (Pharmacia). Specific IgE was determined for all inhalant allergens and for oregano, thyme, marjoram, and basil with commercial CAP system Pharmacia diagnostics (Sweden). The results were measured in U/mL, and we considered 0.35 U/mL as the lower limit of detection for this technique. We also determined the presence of allergen-specific IgE by ELISA, with Phadezym RAST (Pharmacia Diagnostics, Uppsala, Sweden). Cyanogen bromide-activated paper discs were coupled with our extracts of oregano, thyme, marjoram, basil, sage, lavender, and mint. Phadezym RAST was performed according to the manufacturer's instructions. The results were expressed in arbitrary units, PRU/mL, from the Phadezym RAST Refer-

ence System. Results greater than 0.35 PRU/mL were considered positive. The amount of hyssop was insufficient for testing. These tests were done in our patient and in all ten control subjects.

RESULTS

Blood count, blood chemistry, and serum immunoglobulins were within normal limits. Skin tests for inhalant allergens were positive to grasses (Phleum, Lolium, Dactylis and Triticum) and negative to other pollens of our environment, including birch and mugwort. The skin tests for plants of the Labiatae family were positive (Table 1).

Skin tests for herbs in our ten control subjects were negative in all cases. Total IgE levels were 406 U/mL. The patient had detectable specific IgE levels to oregano, thyme, and some other plants of the family (Table 1). Neither of the two methods detected specific IgE to any herb in any of the ten control subjects.

Given the high risk of an anaphylactic reaction and the fact that the in vivo and in vitro test results clearly showed an immediate hypersensitivity mechanism, no oral challenges were undertaken with the herbs our patient was allergic to.

DISCUSSION

No cases of anaphylaxis due to the ingestion of oregano or thyme have been described in the medical literature. Skin tests are highly effective in diagnosing these immediate hypersen-

sitivity reactions, and much better than the in vitro tests. We obtained better results with skin tests done with the extracts prepared by the Frugoni method than with the prick by prick technique, probably because we used dried commercial herbs.

The CAP system was more sensitive than the Phadezym RAST in detecting low levels of specific IgE, but the Phadezym RAST with discs sensitized with our extracts detected specific IgE for all the herbs tested.

Other authors have investigated cross-sensitivity between herbs, vegetables, and birch and mugwort pollens. In our patient the skin tests to birch and mugwort pollen were negative, and the patient had never presented any reaction to vegetables (celery or carrot) or fruit. The herbs involved in this case, however, belong to a different botanical family.⁴⁻⁷ The clinical history and the in vivo tests results suggest that there is cross-sensitivity between the plants belonging to Labiatae family. Studies of RAST inhibition will nonetheless be necessary to confirm these phenomena. Further studies are also needed for antigen characterization.

In conclusion, patients with anaphylactic reactions related to the ingestion of certain foods should make certain that what they are about to eat or drink contains none of the ingredients to which they are allergic.

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Table 1. Skin Prick and In Vitro Test Results

Allergen	Skin Tests		In Vitro Tests	
	Prick by Prick	Skin Prick	CAP System, U/mL	Phadezym RAST System, PRU/mL
Basil (<i>Ocimum basilicum</i>)	Negative	++	1.19	0.6
Lavender (<i>Lavandula officinalis</i>)	Negative	++	Negative	0.4
Hyssop (<i>Hyssopus officinalis</i>)	+	++	Not done	Not done
Marjoram (<i>Origanum majorana</i>)	+	++	3.73	0.7
Mint (<i>Mentha piperita</i>)	++	++	Negative	0.4
Oregano (<i>Origanum vulgare</i>)	++	+	0.384	0.3
Thyme (<i>Thymus vulgaris</i>)	++	++	2.67	0.4
Sage (<i>Salvis officinalis</i>)	++	+	Negative	1.1

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Request for reprints should be addressed to:
Manuel Benito, MD
Hospital Clinico Universitario
Servicio de Alergia
Av Blasco Ibanez, 17
E-46010 Valencia
Spain

A conversation with my grandchildren A tribute to Diane Schuller, MD

My dear Hannah and Emma,
This is a gift from me,
To know an extraordinary woman,
One whose gifts I would wish for you.

I call her the Iron Lady,
The Margaret Thatcher of allergy.
Who's Margaret and what's allergy?
Should have known you'd ask.

Diane is like Tiffany glass,
Anxious to offer the exquisite to everyone,
Ready to grasp the antagonist's hand,
But not without purpose and honor.

Deflecting the frivolous, open to all ideas,
Fearing not tears, the emotion of humans,
Blessed by the lessons of peacemakers,
O'Connell, Berman, Lee, Scanlon...

Glass can be cracked or crumbled.
Sometimes fairness falters and greed prevails.
The need for control darkens the light for many.
Humility too often is seen as an empty vessel.

Besieged by the idols of expediency,
She was tested and found undaunted,
For even the most fragile art can sustain life
With the moving finger of an indomitable will.

Death's chilling brush can defeat even the intrepid,
Or it can forge a new purpose, a new allegiance
To the Aesculapian order and to kindness,
For kindness is God's ultimate whisper.

Mom to the short of breath and fearful,
Daughter of simple dignity that instructs us all,
Niece to the strength of example and hope,
Champion of the patient, specialty and oath.

Unencumbered by the sirens of power,
Persuaded by the needs of the sick and poor,
Dedicated to something beyond the largess of this life,
Determined to grasp the hand that created her.

Another Diane Schuller may not pass my way,
But I have hope, because I have you, Hannah, and you, Emma.
With such gifts as your mom and dad have given,
Who dares limit the grace of God?

JOHN C SELNER, MD
Denver, Colorado

Hannah was 17 months old and Emma, 14 days old when these words were penned.
They are part of a series entitled: The Endless Conversation.