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Oral mite anaphylaxis

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Since the first case of oral mite anaphylaxis (OMA) was described (*J Allergy Clin Immunol* 1993;92:846-9), only few more cases of have been reported. The phenotype of OMA is an immediate food reaction by mite-contaminated foods (1) in patients with previous allergic rhinitis and/or asthma by sensitization to mites.

By August

2009, we compiled data of 42 patients

(Table 1) with clinical history of immediate reactions to flour-based

foods, sugges-

tive of IgE-mediated hypersensitivity, and without food allergy: OMA events.

All patients presented allergic rhinoconjunctivitis with/without bronchial asthma by sensitization to dust mites.

After obtaining a written informed consent from each patient for every single test, skin prick tests (SPT) were carried out with fresh and commercial extract of involved foodstuffs including flour, milk, egg, nuts, seafood, fish, fruits, meats and spices. Specific food allergy was ruled out in all patients by negative SPT, serum-specific IgE (UniCAP; Phadia, Uppsala, Sweden) and single-blinded placebo-controlled oral challenge (SBPCOC) with every single ingredient. Study of putative

flours was also completed in 11 cases, detecting mites in nine samples. Interestingly, all contaminated samples showing *Thyreophagus entomophagus* as the unique species.

With these results, SPT were performed with a battery of aero-allergens including common mites and *T. entomophagus* (Leti, Madrid, Spain). SPT with *T. entomophagus* were positive in all 42 patients. Five *T. entomophagus*-sensitized patients agreed to perform SBPCOC with *T. entomophagus* lyophilized extract (1 mg/ml) starting with 0.1 mg and followed by increasing twofold doses of protein extract given at 60 min intervals. Total cumulative dose was 6.8 mg (47 500 mites) of lyophilized mite extract. All five patients tolerated the challenge with no side-effects.

Non-steroidal anti-inflammatory drugs (NSAIDs) hypersensitivity diagnosis was established by SBPCOC with acetylsalicylic acid (ASA). Challenge was not performed in patients who showed at least two adverse reactions with two different NSAIDs or severe reactions. Interestingly, a positive diagnosis of NSAID intolerance was established in 21 patients (50%), who suffered episodes of periorbital angioedema with/without urticaria (five with added asthma). Nineteen patients revealed episodes of NSAIDs intolerance some years before OMA.

In this report, we have demonstrated that all patients with OMA reactions had sensitization to *T. entomophagus*. Remarkably, *T. entomophagus*, which has been merely described as storage mite in German farms (2) was present in stored opened flour bags in kitchens of these sensitized patients. Differently, it has not been found, as the only species implied, by other groups studying

OMA, which have recognized mites triggering allergic manifestations (1, 3) after their ingestion, even after cooking.

Up to date, group 2 of mite allergens have been suggested as the most probably implicated in OMA episodes (3) as it is resistant to low pH, heating and digestion by proteases. However, Group 1, but not group 2, has been found to be masked by flour components and binding to flour's prolamines, resulting in an underestimation of the mite content in bakery dust (4).

In our study, mite count has been low and all the SBPCOC were negative. Consequently, there might be other causes underneath. Very interestingly, a high prevalence of NSAIDs hypersensitivity has been observed in this specific population. Furthermore, it has been noticed how acetylsalicylic acid enhances anaphylactic episodes after food intake (5). However, Blanco et al. who also found *T. entomophagus* in some flours in the Canary Islands, were not able to demonstrate ASA in flours (1). Sato et al. (6) found a salicylaldehyde analog identified as 2-formyl-3-hydroxybenzyl formate in opisthonotal gland secretion of *Dermatophagoides pteronyssinus*. It is certainly a possibility that some infested flours by mites have also salicylaldehyde analogs with a cyclooxygenase (COX) inhibitory activity. Maybe two triggers are necessary to develop an OMA episode in a susceptible patient: intake of substance with a COX inhibitory activity and the intake of the mite proteins. More extensive studies are necessary to clarify this.

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We present the clinical features with oral mite anaphylaxis by the uncommon storage mite *Thyreophagus entomophagus*.

Table 1 Clinical data of patients with oral mite anaphylaxis (OMA) events

No	Sex	Age	Atopy	Implicated food	Year event*	Reaction interval	Symptoms OMA	NSAIDs intolerant	Flour mites/g
1	F	19	RC	Crepes/'01		2 h	RC/AE	A/AE/2000	N.D.
2	F	20	RC + A	Croquettes, Pancake/'01		30'	U/AE/hTA/A × 2	No	1200
3	F	25	RC + A	Pancake, Battered foods × 2		20–30'	OAS, RC + AE × 2	No	N.D.
4	F	12	RC + A	Croquettes		10–15'	AE	AE	N.D.
5	M	39	RC	Chocolat w/cornstarch, panc/'01		5'–20'	AE- AE/U	A/U/AE 2000	N.D.
6	M	26	RC + A	Pancake		1 h	U	No	N.D.
7	M	17	RC + A	Croquettes/'00		10–15'	AE + U + A	AE/A/2000	N.D.
8	M	27	RC	Pancake × 2, Battered foods/'02		5'	AE × 2, AE/U	AE/2003	960
9	F	45	R	Pancake × 2, Battered foods		5'	AE/U/hTA × 3	No	N.D.
10	F	27	RC + A	Pancake, Homemade bread		5'	AE × 2	No	N.D.
11	M	37	RC	Pancake, Croquettes		15'	AE/U/A × 2	No	N.D.
12	M	17	RC + A	Pancake		10'	AE/U/A	No	N.D.
13	M	16	A	Battered foods × 6/'01		5'	U × 6	AE/2000	N.D.
14	F	28	RC + A	Croquettes, Battered foods, cookies		5	U, A, hTA × 3	No	N.D.
15	M	38	RC + A	Crepes, Pizza, Pancake/'00		30'	hTA, U, A × 3	AE/A/1989	1067
16	F	36	RC	Pancake		5'	RC/A/U/AE	No	N.D.
17	F	22	RC + A	Battered foods		5'	A/AE	No	N.D.
18	M	34	RC + A	Pancake/'01		10'	RC/A/U/AE	AE/1992	N.D.
19	M	29	RC + A	Pancake, Croquettes/'04		5'	AE/dysphonia	No	N.D.
20	F	32	RC + A	Croquettes/'08		5'	AE/A	AE/1991	N.D.
21	F	42	RC	Pancake/'04 Muffins/'05		5'	AE/dysphonia/TE × 2	AE/1991	N.D.
22	M	35	RC + A	Pancake, Homemade cookies/'00		5'	AE/dysphagia/A	AE/1982	N.D.
23	F	23	RC	Pancake/'08		2 h	AE/A	AE/2002	N.D.
24	M	35	RC + A	Homemade cookies/		5'	A/AE/U/hTA	No	N.D.
25	F	25	RC + A	Battered foods/'02		15'	RC+A	AE/A 1997	N.D.
26	M	13	RC + A	Crepes, Homemade muffins/'08		15'	A/U × 3	AE, 2001	104
27	M	42	RC	Pancake/'08		5'	RC/A/U	No	1477
28	F	35	RC	Pancake		30'	RC/A/U	No	N.D.
29	F	15	RC + A	Hallaca* with cornstarch		2 h	AE/A	No	N.D.
30	M	20	RC + A	Cookies, Battered foods, Crepes		15'	AE/A/U	No	3905
31	M	25	R	Pancake/'08		5'	AE/U	AE/2008	1680
32	F	20	RC + A	Battered food/'08		30'	AE/U	AE/U/2005	5275
33	F	22	RC + A	Crepes		60'	A/U	No	33 634
34	F	15	RC	Homemade cookies		5'	A/U/AE/AP	No	No mites
35	M	57	RC	Battered foods		5'	AE/A	No	No mites
36	M	27	RC	Lasagna		20'	AE	No	N.D.
37	M	33	RC	Crepes/'07			AE + A	AE/2007	N.D.
38	F	13	RC	Crepes/'08		1 h	AE/U/A	AE/2008	N.D.
39	F	11	RC + A	Croquettes, Pancake/'00			SAO × 2	AE/1999	N.D.
40	M	38	RC	Battered foods, Pancake/'05		20'	AE/U	AE/2000	N.D.
41	F	26	RC + A	Battered foods/'09		2 h + EIA	AE/R/A/U	AE/2001	N.D.
42	M	23	RC + A	Croquettes, Battered foods/'06		5'	AE/U/A	AE/1997	N.D.

F, female; M, male; R, rhinitis; RC, rhinoconjunctivitis; A, bronchial asthma; U, urticaria; AE, angioedema; OAS, oral allergy syndrome; EIA, exercise-induced anaphylaxis; hTA, hypotension; TE, Tongue edema; N.D., Not done; AP, abdominal pain, year event*.

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