



Letter

Wheat-dependent exercise-induced anaphylaxis in elderly patients

Food-dependent exercise-induced-anaphylaxis (FDEIA) is caused by aerobic exercise within 2 to 4 hours after ingestion of food. However, this clinical presentation can be variable in severity, and with respect to the quantity of food ingested and the exercise intensity.^{1,2} We describe the peculiarities of the clinical presentation in 2 elderly patients.

Case 1

An 85-year-old woman suffered from hypertension and hypothyroidism controlled with irbesartan and levothyroxine. Since 1980, she had presented several episodes of widespread itchy wheals, vomiting, and diarrhea, with syncope associated in 5 of those episodes. The patient improved in 15 to 30 minutes after unknown treatment. The symptoms seemed to coincide with stress somewhat greater than usual as doing homework or crossing a crosswalk.

Case 2

A 79-year-old man had a history of hypertension and stroke treated with amlodipine and acetylsalicylic acid. In 2004, he pre-

sented with an episode of itchy skin with generalized hives, tongue edema and syncope. The patient was treated with unknown intravenous drugs in the emergency unit. Subsequently, he developed 7 to 8 episodes of mild itchy skin and isolated hives, with improvement in 1 hour with corticosteroids and antihistamines. He remembered that, on occasion, the onset of symptoms had been preceded by work in his garden.

We applied a clinical practice protocol study of anaphylaxis, including tryptase and other laboratory tests (Table 1), and electrocardiographic and radiological examinations, with normal or negative results. Prick tests with inhalant aeroallergens and commercial extracts of foods, *Anisakis*, and latex were negative, except to gliadin (ALK-Abelló, Madrid, Spain). In both cases, elevated levels of serum-specific IgE to recombinant omega-5 gliadin were detected by ImmunoCAP system (Phadia, Uppsala, Sweden). The study results are summarized in Table 1. In view of them, we performed a detailed clinical history, because there seemed not to be a clear relationship between symptoms and physical exercise. Both patients recognized that they were regular consumers of products with wheat, and it was possible that their symptoms coincided with exercise more than usual, as previously detailed. They have remained asymptomatic by avoiding any significant physical activity for at least 3 hours after the ingestion of wheat.

Disclosures: Authors have nothing to disclose.

Table 1

Complementary tests performed and results obtained in both patients

	Case 1	Case 2
Prick tests to inhalant aeroallergens (house dust mites and storage mites, pollens from grasses, weeds and trees, moulds, dog and cat epithelia, feathers, and cockroach)	Negative	Negative
Prick tests to commercial extracts of <i>Anisakis</i> and latex	Negative	Negative
Prick tests to commercial extracts of foods (egg protein fractions, milk and cereals, nuts, blue and white fish, shellfish and molluscs, meats, fruits, and vegetables)	Gliadin (9 mm); other negative	Gliadin (7 mm); other negative
Blood count, erythrocyte sedimentation rate, biochemistry, urine analysis	Normal	Normal
Thyroid hormones	Normal	Normal
Serum iron and ferritin	Normal	Normal
Total immunoglobulins	Normal	Normal
Serum proteinogram	Normal	Normal
Serology (HBV, HCV, hydatidosis, rheumatic)	Normal or negative	Normal or negative
CH-50, C3, C4, C1-inhibitor	Normal	Normal
Autoimmunity (ANA, anti-DNA, antimitochondrials, antithyroids)	ANA 1/40 homogeneous pattern	Negative
Circulating immune complexes	Normal	Normal
Serum tryptase	Normal	Normal
Total IgE	113 UI/mL	35 UI/mL
Specific IgE to parasites (<i>Ascaris</i> , <i>Echinococcus</i> , and <i>Anisakis</i>)	Negative	Negative
Specific IgE to recombinant omega-5 gliadin (rTri a 19)	4.76 kU/L	3.05 kU/L
Urine vanilmandelic acid and 5-OH indol acetic acid	Normal	Normal
Urine catecholamines	Normal	Normal
Stool ova and parasites	Negative	Negative
Chest radiography and paranasal sinuses	Normal	Normal
Abdominal ultrasound or computed tomography	Normal	Normal
Electrocardiogram	Normal	Normal

Food-dependent exercise-induced-anaphylaxis is a severe form of allergy whereby ingestion of a specific food before physical exercise induces symptoms of anaphylaxis. Although various foods have been associated with this entity, the most frequently reported cause seems to be wheat in Europe.³ It mainly affects adolescents and young adults, and a personal or family history of atopy is frequent.³ It is triggered by exercise, usually an aerobic exercise such as jogging.³ Food ingestion may occur first and physical exercise no more than 2 to 4 hours after.

Recombinant omega-5gliadin (rTri a 19) has been identified as a major allergen for adults with wheat-dependent exercise-induced anaphylaxis (WDEIA) as well as children with wheat-induced anaphylaxis.⁴ Different authors suggest that omega-5 gliadin-specific immunoglobulin E (IgE) measure is a reliable test to diagnose wheat allergy,^{5–8} as it was in our cases. Although we believe, based on the clinical history, specific IgE to recombinant omega-5 gliadin, and the improvement with the withdrawal of wheat from the diet that our patients had WDEIA, we realize that an exercise challenge after wheat ingestion is necessary to definitely establish this diagnosis, because challenge remains the gold standard test in allergy.

The clinical presentation of WDEIA can be extremely variable, so a high index of clinical suspicion is required to initiate the investigation pathway and therefore to avoid underdiagnosis or diagnostic delay.¹ In addition to that, the number of attacks tends to decrease or stabilize over time,³ symptoms of WDEIA can be different in the same patient because they can depend on the quantity of wheat ingested,^{1,2} subjects may not show clinical reactivity each time they are subjected to the trigger,¹ and symptoms do not always occur when performing the same exercise intensity^{1,2} or with the same latency period since the food was ingested.

WDEIA has been described in young adults but not in many elderly people: Yacoub et al² reported a 62-year-old man who presented WDEIA, Park et al⁷ included 13 patients with anaphylaxis for further detection of serum-specific IgE to recombinant omega-5 gliadin, but the oldest one diagnosed with WDEIA was 56 years old⁷; meanwhile Wong et al¹ tested 17 patients, but only 8 of them were ultimately diagnosed with WDEIA, and the oldest one was 53 years old. However, our patients suffered those episodes and were diagnosed with WDEIA at a later age. In fact, the suspected diagnosis is more difficult for elderly people, because the concept of exercise is not well defined in these cases. So, it is important to

insist on the physical exercise intensity that triggers the symptoms and to examine it according to the style of life and age. For this reason, the new terminology “activity-dependent wheat allergy” has been proposed for that kind of patient.¹

To conclude, we report 2 elderly patients who presented several episodes of WDEIA after performing minimum physical exercise with detection of serum recombinant omega-5 gliadin-specific IgE. WDEIA is not frequently reported in elderly people. The concept of exercise or exertion is not well defined in the elderly, and physical activities of mild intensity may trigger this life-threatening entity. Therefore, the final diagnosis must be reached after a thorough clinical anamnesis.

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References

- [1] Wong GKY, Huissoon AP, Goddard S, Collins DM, Krishna MT. Wheat dependent exercise induced anaphylaxis: is this an appropriate terminology? *J Clin Pathol*. 2010;63:814–817.
- [2] Yacoub MR, Savi E, Burastero SE, et al. Omega-5 gliadin anaphylaxis: an integrated diagnostic approach. *Eur Ann Allergy Clin Immunol*. 2011;43:92–94.
- [3] Shadick NA, Liang MH, Partridge AJ, et al. The natural history of exercise-induced anaphylaxis: survey results from a 10-year follow-up study. *J Allergy Clin Immunol*. 1999;104:123–127.
- [4] Palosuo K, Varjonen E, Kekki O-M, et al. Wheat omega-5 gliadin is a major allergen in children with immediate allergy to ingested wheat. *J Allergy Clin Immunol*. 2001;108:634–638.
- [5] Jacquenet S, Morisset M, Battais F, et al. Interest of ImmunoCAP system to recombinant omega-5 gliadin for the diagnosis of exercise-induced wheat allergy. *Int Arch Allergy Immunol*. 2009;149:74–80.
- [6] Matsuo H, Dahlström J, Tanaka A, et al. Sensitivity and specificity of recombinant ω -5 gliadin-specific IgE measurement for the diagnosis of wheat-dependent exercise-induced anaphylaxis. *Allergy*. 2008;63:233–236.
- [7] Park H-J, Kim J-H, Kim J-E, et al. Diagnostic value of the serum-specific IgE ratio of omega-5 gliadin to wheat in adult patients with wheat-induced anaphylaxis. *Int Arch Allergy Immunol*. 2012;157:147–150.
- [8] Morita E, Chinuki Y, Takahashi H, Nabika T, Yamasaki M, Shiwaku K. Prevalence of wheat allergy in Japanese adults. *Allergol Int*. 2012;61:101–105.