

ALEX²® Case Study No. 6

Grigori, 14 years, from St. Petersburg, Russia



Clinical history

Grigori has suffered from itchy, watery eyes and rhinitis since he was 8 years old. With the help of a blood and skin test, he was diagnosed with grass pollen and house dust mite allergy. Treatment with antihistamines led to a significant improvement of his symptoms.

Family history

His mother has suffered from grass pollen allergy for decades. His father is not allergic.

Present situation (2021)

Today Grigori is 12 years old, and in his free time he loves to play football with his friends. During a football tournament, he starts coughing and sweating and feels his lips swelling and his throat constricting. Grigori is rushed to the emergency room. There he is given oxygen and adrenaline intravenously.

Where did this vehement reaction come from? Grigori's doctor takes an extensive medical history after the initial treatment, which reveals that an insect has stung him in the leg shortly before the match. He has reacted strongly to insect bites several times before. Therefore, the suspicion is obvious: bee and/or wasp venom allergy. The boy also says that he ate a stuffed sandwich after school and then rushed to the football tournament. A possible wheat allergy was considered unlikely, as the boy had never had problems with wheat-containing products before.

To confirm the suspicion of insecticide allergy, a blood test using ALEX²® is ordered.

ALEX²® Results*

Allergen Source	Allergen	Biochemical Designation	IgE Level [kU _A /L]
	tlgE		175.81
Perennial ryegrass	Lol p 1	Beta-Expansin	17.59
Timothy grass pollen	Phl p 1	Beta-Expansin	27.37
American house dust mite	Der f 2	NPC2 Family	26.13
European house dust mite	Der p 2	NPC2 Family	30.26
Common wasp venom	Ves v	Extract	3.58
Common wasp venom	Ves v 1	Phospholipase A1	0.41
Common wasp venom	Ves v 5	Antigen 5	13.29
Wheat	Tri a 19	Omega - 5 -Gliadin	18.16
Rye	Sec c_pollen	Extract	15.15

*For convenience extract results are not shown, if a corresponding component was positive.

Interpretation

- The results of the skin test were confirmed at the molecular level for grass pollen and house dust mites.
- The major grass pollen allergens Lol p 1 and Phl p 1 were positive - allergen-specific immunotherapy (AIT) is indicated if corresponding clinical symptoms are present.
- Pollen extract from rye showed a positive result due to cross-reactivity to the timothy components Phl p 1 and Lol p 1.
- Mite sensitisation was confirmed in the ALEX²® allergy test, Der f 2 and Der p 2 showed a positive result. Der f 2 and Der p 2 are members of the NPC 2 family and are known for their high cross-reactivity within related proteins.
- Sensitisation to wasp extract, Ves v 1 and Ves v 5 was detected. Ves v 1 is a member of the phospholipase A1 and Ves v 5 is a member of the antigen 5 allergen family. Both allergens serve as markers for an AIT indication if corresponding symptoms are present. The degree of their cross-reactivity is high within the respective allergen family.
- The clinical reaction to wheat was confirmed by the presence of IgE antibodies against omega-5-gliadin. Tri a 19 is a wheat protein of the gluten fraction and major allergen in children with wheat allergy. In addition, it is a risk marker for severe allergic as well as wheat-dependent exercise-induced reactions.

Summary

The results of the ALEX²® allergy test, in conjunction with the medical history, made it clear that the patient had a wheat allergy that was triggered by physical exertion, termed wheat-dependent exercise-induced anaphylaxis. In addition, the patient was diagnosed with a clinically relevant wasp venom sensitisation.

To prevent an anaphylactic shock, the patient should avoid wheat products from now on. Due to a possible cross-reactivity between gluten proteins (gliadins and glutenins), the patient should also completely avoid rye and barley. In addition, he is given an emergency kit consisting of an adrenaline autoinjector, a corticosteroid, and an antihistamine.