



Cross-reaction between house dust mites and crustaceans as a cause of anaphylactic shock complicating the allergen immunotherapy

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Introduction

A cross-reaction might occur when the epitopes of two different allergens have a high degree of structural similarity. Immunoglobulins E originally produced against a specific antigen recognize and bind a protein of similar structure from another source. The clinical picture of such reactions varies from local symptoms to life-threatening systemic reactions.

Case description

A 12-year-old girl came to the allergy clinic complaining of perennial rhinitis.

Due to the probable allergic etiology of the disease, skin prick tests were performed.

The highest skin reaction was observed for house dust mites - *Dermatophagoides farinae* (7x7mm) and *Dermatophagoides pteronyssinus* (6x6mm). Diagnostics were extended by determining specific IgE. The value for *D.farinae* was 78.12 kU/l, and for *D.pteronyssinus* 58.58 kU/l, which classified the result to class 5. The patient was referred to specific subcutaneous immunotherapy for desensitization. Administration of the first eleven doses during the incremental phase did not cause any side effects. However, 5 minutes after administering the 12th dose of the vaccine, disturbing symptoms appeared, such as shortness of breath, wheezing over the lung fields, trunk urticaria and abdominal pain. Saturation dropped to 89% and HR increased to 130 bpm. After the medical intervention, including the subcutaneous injection of 0,3 mg of adrenaline, the patient's condition stabilized. The nature of the symptoms indicated the occurrence of anaphylactic shock. Further diagnostics were performed to detect



XV MIĘDZYNARODOWY KONGRES POLSKIEGO TOWARZYSTWA ALERGOLOGICZNEGO

the cause of the anaphylactic reaction. Blood count showed a significantly increased concentration of IgE antibodies 587.8 H IU/ml. In the interview, the patient revealed that she ate shrimps few hours before anaphylaxis. No symptoms were noticed during the meal. Cross-reaction was suspected. In order to confirm this hypothesis, the immunoCAP test was performed twice, determining IgE antibodies against fish and shellfish allergens. The results (1.58 kU/I and 1.18 kU/I) classified the allergy as class 2. This confirmed the assumption that the cause of anaphylactic shock was a cross-reaction between house dust mites and shrimps.

Conclusions

The allergen responsible for the described cross-reactivity is tropomyosin. Currently, thanks to modern diagnostic tests, it is possible to detect allergen molecules and thus assess the risk of cross-reaction. Molecular diagnostics increases patient safety and should be considered as a diagnostic procedure in such cases.

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