Component-resolved diagnostics to direct in venom immunotherapy: Important steps towards precision medicine.

Abstract:

Stings of Hymenoptera can induce IgE-mediated systemic and even fatal allergic reactions. Venom-specific immunotherapy (VIT) is the only disease-modifying and curative treatment of venom allergy. However, choosing the correct venom for VIT represents a necessary prerequisite for efficient protection against further anaphylactic sting reactions after VIT. In the past, therapeutic decisions based on the measurement of specific IgE (sIgE) levels to whole venom extracts were not always straightforward, especially when the patient was not able to identify the culprit insect. In the last years, the increasing knowledge about the molecular structure and relevance of important venom allergens and their availability as recombinant allergens, devoid of cross-reactive carbohydrate determinants, resulted in the development of an advanced component-resolved diagnostics (CRD) approach in venom allergy. Already to date, CRD has increased the sensitivity of sIgE detection and enabled the discrimination between primary sensitization and cross-reactivity, particularly in patients with sensitization to both honeybee and vespid venom. Hence, CRD in many patients improves the selection of the appropriate immunotherapeutic intervention. Moreover, the detailed knowledge about sensitization profiles on a molecular level might open new options to identify patients who are at increased risk of side-effects or not to respond to immunotherapy. Therefore,
increasing potential of CRD becomes evident, to direct therapeutic decisions in a personalized and patient-tailored manner. Reviewed here are the state of the art options, recent developments and future perspectives of CRD of Hymenoptera venom allergy.