**Value of specific IgE against storage proteins for the diagnosis of tree nut and peanut allergy**

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**Aims:** Double blind placebo controlled food challenge (DBPCFC) is the gold standard in food allergy diagnosis, reflecting the clinical outcome of food allergic patients. Studies have shown that component resolved specific IgE (sIgE) testing can aid in the diagnosis of food allergies by the detection of sIgE against distinct proteins. Here, we investigated the advantage of component based multiplex sIgE testing in diagnosing subjects with suspected tree nut and peanut allergy.

**Methods:** Patients from Germany with suspected tree nut and/or peanut allergy were included. Four clinical symptom groups based on a clinical questionnaire, skin prick testing (SPT), occasionally sIgE measurement and DBPCFCs were defined and referred as no symptoms, no symptoms/tolerant, oral allergy syndrome (OAS), and grade I-IV anaphylaxis (ANA). Subsequently sera from all subjects were investigated for sIgE using EUROLINE sIgE multiparameter tests (EUROIMMUN, Luebeck, Germany) with extracts and components of distinct tree nuts (hazelnut, walnut, macadamia nut, cashew nut, pecan nut, Brazil nut, and pistachio) and peanut.

**Results:** SPT indicated sensitization to tree nut and/or peanut, and pollen in 68 subjects. 41% and 59% of these subjects presented with OAS and ANA, respectively. As determined by EUROLINE tests, subjects from both symptom groups were sensitized to PR-10 proteins from hazelnut (Cor a 1: OAS 89%; ANA 95%), almond (Pru du 1: OAS 36%; ANA 43%), and peanut (Ara h 8: OAS 18%; ANA 23%). The sensitization to storage proteins from tree nuts and peanut was almost exclusively shown in anaphylactic patients, 33% of which were positive for sIgE against storage proteins from more than one tree nut and/or peanut. Moreover, among anaphylactic patients, sIgE against Ara h 6 was most frequently (38%) detected.

**Discussion:** In this cohort, sensitization to storage proteins from tree nut and/or peanut was highly associated with ANA, indicating that the detection of sIgE against storage proteins can improve the assessment of clinical outcome in allergic patients. In contrast, anti-PR-10 IgE gave no indication on clinical outcome since the majority of subjects with tree nut and/or peanut allergy was sensitized to PR-10 protein due to cross-reactivity to birch pollen.

**Conclusion:** Component based multiplex sIgE tests including storage proteins can aid in assessing the risk of ANA that provides additional value for the diagnosis of serious allergic reactions in tree nut and peanut allergy.