sIgE Ana o 1, 2 and 3 accurately distinguish tolerant from allergic children sensitised to cashew nuts

Johanna P.M. van der Valk¹, Roy Gerth van Wijk¹, Yvonne Vergouwe², Ewout W. Steyerberg², Marit Reitsma³, Harry J. Wichers³, Huub F.J. Savelkoul⁴, Berber Vlieg-Boerstra⁵, Hans de Groot⁶, Anthony E.J. Dubois⁷, Nicolette W. de Jong¹

¹Department of Internal Medicine, Allergology, Erasmus MC, Rotterdam, the Netherlands; ²Center for Medical Decision Making, Department of Public Health, Erasmus MC, Rotterdam, the Netherlands; ³Wageningen UR Food & Biobased Research, the Netherlands; ⁴Laboratory of Cell Biology and Immunology, Wageningen University, the Netherlands; ⁵Department of Paediatrics, Onze Lieve Vrouwe Gasthuis (OLVG), Amsterdam, the Netherlands; ⁶Department of Pediatric Allergology, Diaconessenhuis Voorburg, RdGG, Delft, the Netherlands; ⁷Department of Pediatric Pulmonology and Pediatric Allergology, University Medical Centre Groningen, GRIAC Research Institute, University of Groningen, the Netherlands

Background: The double-blind, placebo-controlled food challenge test (DBPCFC) is the gold standard in cashew nut allergy. This test is costly, time-consuming and not without side effects. Analysis of IgE-reactivity to cashew nut components may reduce the need for food challenge tests.

Methods: In a prospective and multicentre study, children with suspected cashew nut allergy underwent a DBPCFC with cashew nut. Specific IgE to total cashew nut and to the components Ana o 1, 2 and 3 were determined. A skin prick test (SPT) with cashew nut extract was performed. The association between the outcome of the food challenge test and specific IgE to Ana o 1, 2 and 3 was assessed with logistic regression analyses, unadjusted and adjusted for other diagnostic variables. Discriminative ability was quantified with a concordance index (c).

Results: 173 children (103 boys, 60%) with a median age of 9 years were included. 79% had a positive challenge test outcome. A steep rise in the risk of a positive challenge was observed for specific IgE to each individual component Ana o 1, 2 and 3 with estimated risks up to approximately 100%. Specific IgE to Ana o 1, 2 and 3 better distinguished between cashew-allergic and tolerant children (c=0.87, 0.85 and 0.89 respectively), than specific IgE to cashew nut or SPT (c=0.76 and 0.83 respectively). In the multivariable models inclusion of sIgE to Ana o 1, 2 or 3 increased the c-index of history and gender from 0.67 to 0.92 maximally, with increases up to 0.92 and 0.93, respectively when also specific IgE to cashew nut or both IgE and SPT were added.

Conclusion: The major cashew nut allergens Ana o 1, 2 and 3 are each individually predictive for the outcome of food challenge tests in cashew-allergic children.