Predictive value of ovomucoid-specific IgE in the diagnosis of egg allergy in Finnish children

Kati Palosuo, Anna Kaarina Kukkonen, Anna Pelkonen, Mika Mäkelä
Helsinki University Hospital, Skin and Allergy Hospital, University of Helsinki, Finland

Aims: To calculate optimal cut-off values for egg white and Gal d 1,2,3, and 4-specific IgE (sIgE) predicting positive oral challenges in 100 Finnish children with suspected egg allergy.

Methods: 100 patients (age 1-19 years, mean 9.2, median 9.6 years) with suspected egg allergy underwent double-blind, placebo-controlled (n=60) or open (n=40) food challenges with heated egg white. Serum IgE levels to egg white as well as the components Gal d 1 (ovomucoid), Gal d 2 (ovalbumin), Gal d 3 (conalbumin) and Gal d 4 (lysozyme) were measured by ImmunoCAP.

Results: Of the 100 challenges 75 were positive. Sensitization to Gal d 1 (ovomucoid) with a cut-off value of >4.3 kU/L predicted a positive challenge with a specificity of 92% and sensitivity of 83%. The likelihood ratio was 10.3. In ROC analysis the area under curve was 0.92 (95% CI, 0.86-0.98). Gal d 1 sIgE levels were significantly higher in the challenge positive (mean 38 kU/L, median 15.8 kU/L) than in the challenge negative group (mean 2.4 kU/L, median 0.5 kU/L), p <0.0001. The diagnostic capacity of sIgE to egg white and Gal d 2, 3 and 4 was clearly weaker. In ROC analysis the AUC for egg white was 0.88, Gal d 2 0.87, Gal d 3 0.78 and Gal d 4 0.76 (Figure 1).

Discussion: Component-specific IgE levels can be useful in predicting outcomes of oral food challenges, but optimal cut-off levels vary in different populations. Sensitization is influenced by many factors including age and geography, whereas challenge outcome is influenced by referral base and challenge procedures. Thus, optimal cut-off levels need to be determined for each population separately. Sensitization to Gal d 1, which is relatively stable against heat and enzymatic digestion, predicts clinical reactivity to both raw and heated egg and is considered a risk factor for persistent egg allergy.

Conclusion: Ovomucoid-specific IgE is useful in distinguishing egg-sensitized patients with clinically reactive egg allergy from those tolerant to heated egg. The optimal cut-off point in a Finnish population of 100 children and adolescents was 4.3 KU/L.

Figure 1