METHODS. SPT to egg proteins including egg white, egg yolk, ovalbumin, and ovomucoid were performed for each patient. If SPT was positive, serum IgE (sIgE) to egg proteins were measured. Patients who were sensitized to egg by SPT or sIgE underwent a single-blind challenge with egg yolk, egg white, and raw egg between 12 and 18 months of age. Food challenge outcome was correlated with SPT and sIgE to determine cutoff points with the best diagnostic accuracy.

RESULTS. Ninety-four patients were sensitized to egg and were challenged to egg in the hospital. Of these, 27 (28.7%) tolerated both cooked and raw egg, and 65 (69.2%) tolerated only cooked egg. The remaining 60 who were non–egg sensitized were instructed to introduce egg at home. Of these, 59 tolerated home introduction of egg. In egg allergic patients, egg white SPT and ovalbumin sIgE had the best area under the curve. High positive predictive values were obtained for egg white SPT and egg white sIgE.

CONCLUSIONS. Sensitized infants with egg white SPT ≥8 mm and/or egg white sIgE ≥8.36 kU/L had high probability of having a positive oral food challenge. For cooked egg allergy, a negative predictive value of 92.8% was found for ovomucoid SPT of 3.5 mm and 94.3% for sIgE of 0.8 kU/L. Notably, the sensitivity and negative predictive values were low for egg white SPT and sIgE, with some patients being symptomatic with egg ingestion despite having low or negative values.

REVIEWER COMMENTS. This study found that in children <18 months of age, more than half of patients with cow’s milk allergy and atopic dermatitis without previous egg consumption are also sensitized to egg, and >60% of those sensitized have allergic reactions to egg. The majority of the sensitized patients in this study were reactive to raw egg only. The results of this study suggest that egg white SPT and/or sIgE testing are useful to assess likelihood of egg allergy and risk stratify when considering food challenges in this population.

Native and Denatured Egg White Protein IgE Tests Discriminate Hen’s Egg Allergic From Egg-Tolerant Children

PURPOSE OF THE STUDY. The goal of this study was to investigate whether immunoglobulin (Ig)E levels to native and denatured hen’s egg proteins could be useful in differentiating those sensitized but clinically tolerant to egg, those allergic to raw but not cooked egg, and those allergic to both raw and cooked egg.

STUDY POPULATION. The study included 44 patients with a median age of 2.1 years who were divided into 3 groups on the basis of open food challenge results: egg tolerant, allergic to raw egg but tolerant to cooked egg (hardboiled or cooked at 180°C for 30 minutes), and allergic to both raw and cooked egg. Positive challenge was defined as having an immediate type reaction; patients with delayed or equivocal reaction were not included.

METHODS. IgE levels to both native and denatured egg white, ovalbumin, and ovomucoid were measured. Serum samples were collected within 6 months of the food challenge that determined the patient’s tolerance/allergy.

RESULTS. Overall, higher titers of egg white–specific IgE correlated with an increased degree of allergy. IgE titers were higher to native proteins than to denatured ones; however, denatured proteins were more helpful in identifying sensitized but tolerant patients. IgE to native egg white was useful in determining cutoff values for raw egg allergic versus egg tolerant patients (1.6 kU/L) and also for raw and cooked egg allergic versus egg tolerant patients (4.1 kU/L) with sensitivity >80% and specificity 100%. Native ovalbumin was found to be best for distinguishing between raw/cooked egg allergy and tolerance to both. Native ovomucoid was best for distinguishing between raw egg allergy and tolerance to cook egg.

CONCLUSIONS. Using a panel of IgE tests to specific native and denatured proteins including egg white, ovomucoid, and ovalbumin can help improve diagnostic accuracy in patients with hen’s egg allergy.

REVIEWER COMMENTS. Egg allergy is among the most frequently diagnosed food allergies in children. Complete elimination of egg can be difficult for patients and families due to widespread use in a Western diet. Many egg-allergic patients can tolerate cooked forms of egg, although egg white–specific IgE alone is often not helpful in predicting who will be tolerant. Using a combination of egg white IgE with testing to ovomucoid and ovalbumin may help in identification of cooked egg tolerant patients. It is still important to interpret the laboratory data in light of the clinical history and to consider oral food challenges before reintroduction of either cooked or uncooked egg products in a previously allergic patient.

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