who may have significant reactions or complications during the therapy.

**STUDY POPULATION.** This study was a nonrandomized controlled, parallel-group intervention trial with an active study population of 50 consecutively enrolled children aged 5 to 18 years. The study children underwent egg OIT after confirming immunoglobulin (IgE)-mediated egg allergy by using a double-blind, placebo-controlled egg food challenge (DBPCFC). The control group included 32 children who also had a positive DBPCFC but continued avoidance during a median observation period of 18 months.

**METHODS.** Subjects were started on an induction phase that lasted 16 weeks, including a 2-day in-hospital intensive rush phase. Once they reached the maintenance phase, children consumed 1 raw egg or their maximal tolerated dose twice weekly for 12 months. All dose-related reactions over a median period of 18 months on OIT (range: 12–28 months) were registered. Children were retrospectively divided into 3 subgroups: (1) children who stopped reacting to OIT doses over time (resolved reactions [RR]); (2) children with ongoing dose-related reactions over the entire period on OIT (persistent reactions); and (3) children who discontinued OIT within the induction phase due to frequent reactions not improved by protocol re-adaptation and medication (early discontinuation).

**RESULTS.** At the end of the induction phase, 40 (80%) children had achieved complete desensitization to egg. In the control group, only 5 (14%) of 32 developed natural tolerance over time ($P < .001$). During the study period, 45 (90%) of the children had dose-related reactions of varying magnitude, and the rate of reactions was 7.6%. Epinephrine was needed in 26% of the children. The 3 subgroups corresponded to 3 different safety phenotypes: (1) 24 children (48%, RR) experienced infrequent and mainly mild reactions that resolved over time (none required epinephrine); (2) 17 children (34%, persistent reactions) experienced more frequent and severe ongoing reactions over time; and (3) 9 children (18%, early discontinuation) had frequent, moderate reactions, and discontinued OIT due to their reactions. In those children who discontinued OIT, high serum-specific IgE levels to egg white, ovomucoid, and ovalbumin were found. They reacted to smaller amounts of egg on initial DBPCFC and had more severe asthma. In contrast, lower egg-specific IgE levels and less severe reactions at food challenge were associated with the subgroup RR. One baseline parameter measured, serum-specific ovomucoid IgE, helped predict the likelihood of tolerating OIT. Levels $<8.85$ kilounit/L indicated 77% probability of belonging to the RR group, whereas levels above it indicated 95% probability of early discontinuation or ongoing reactions over time.

**CONCLUSIONS.** The results of this study showed that egg OIT could induce desensitization in a large number of subjects with egg allergy. Egg OIT involves substantial risks, but baseline parameters, particularly ovomucoid serum-specific IgE, may help identify which children are better candidates for this therapy.

**REVIEWER COMMENTS.** This study tries to determine which children are not good candidates for this therapy. This study had higher reaction rates than previous studies, presumably related to participant selection criteria. The results reinforce the need for appropriate patient selection for OIT and place a significant emphasis on safety, highlighting that the safety and efficacy of OIT are still not well established. Serum-specific ovomucoid IgE level may be helpful in determining which children are not good candidates for such therapy.

**UR**


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**Baked Egg Food Challenges—Clinical Utility of Skin Test to Baked Egg and Ovomucoid in Children With Egg Allergy**


**PURPOSE OF THE STUDY.** The goal of this study was to investigate if a skin prick test to ovomucoid and baked egg could predict which patients would pass an oral food challenge (OFC) to baked egg.

**STUDY POPULATION.** This prospective study evaluated 143 children from the allergy clinics at the Children’s Hospital at Westmead (Sydney, Australia). These children had a high probability of egg allergy based on either: (1) clinical reactions to egg within the 12 months before the study and positive skin prick test result or serum-specific IgE to egg white; or (2) skin prick test result or serum-specific IgE to egg white $>95$ positive predictive values previously established in those who did not ingest egg.

**METHODS.** Subjects underwent skin prick testing to egg white, ovomucoid, and baked egg muffin homogenized with normal saline on the day of the OFC. The skin prick tests were performed according to standard techniques, and positive results were wheal size at least 3 mm greater than that of the saline control subject at 15 minutes. The OFC used baked egg muffins with 1 g of egg per muffin challenge.

**RESULTS.** A total of 143 OFCs were conducted; 90 (63%) were negative. Of the 53 failed challenges, 3 had severe reactions. The medium skin prick size for failed challenges was 6.0 mm for muffin, 7.5 mm for ovomucoid, and 9.0 mm for egg white, whereas the size for passed challenges was 4.0 mm, 5.0 mm, and 8.0 mm for muffin, ovomucoid, and egg white, respectively. Skin test size did not predict severity. A skin prick test size of $<2$ mm to the baked egg...
muffin had 88% negative predictive value and a skin prick test size of ≥11 mm to ovomucoid had a positive predictive value of 100%.

CONCLUSIONS. The results of this study found that skin prick tests to ovomucoid and to baked egg muffin homogenized with normal saline could be helpful in deciding if egg-allergic patients are ready for OFC to baked egg. A skin prick test result of <2 mm to muffin had an 88% negative predictive value and an ovomucoid skin prick test result ≥11 mm had a positive predictive value of 100%.

REVIEWER COMMENTS. Although it is known that 60% to 70% of egg-allergic children can tolerate “baked egg” in their diet, it is often difficult to identify this subpopulation. Recently, ovomucoid-specific IgE levels have been shown to be useful in helping predict the outcome of OFCs to baked egg, but only when the levels are >10 kUA/L (97% positive predictive value). This study uses 2 new skin testing reagents (ovomucoid and muffin suspension) in an attempt to identify who might be able to eat baked egg. Using this approach, a 100% positive predictive value and an 88% negative predictive value have been determined. Although the majority of egg-allergic children will fall outside of these parameters, this approach could reduce the need for OFCs. Importantly, the skin response did not predict the severity of the reaction.


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Sensitization to Cor a 9 and Cor a 14 Is Highly Specific for a Hazelnut Allergy With Objective Symptoms in Dutch Children and Adults

PURPOSE OF THE STUDY. The goal of this study was to determine if component-resolved testing will aid in determining patients at risk for allergic reactions to hazelnut.

STUDY POPULATION. A total of 161 adults and children with sensitization (≥0.35 kUA/L) to hazelnut were retrospectively recruited between 2010 and 2012 at the University Medical Center Utrecht (Utrecht, the Netherlands).

METHODS. Forty children and 15 adults with objective symptoms on double-blind, placebo-controlled food challenges (DBPCFCs) and 24 adults with a convincing history of reaction were compared with 41 children and 41 adults with no symptoms on DBPCFCs. Specific IgE levels to hazelnut extract and single components were analyzed with ImmunoCAP and compared between the study groups. The diagnostic value of IgE levels for discrimination between hazelnut allergy with objective symptoms and no or subjective symptoms was determined by calculating the area under the curve of the receiver-operating characteristic.

RESULTS. Asthma was more common among adults with hazelnut allergy with objective symptoms than those with no or subjective symptoms (P = .03). Asthma was more common in children than adults with no or subjective symptoms of hazelnut allergy (P = .04). All children and most adults (97%) with subjective hazelnut allergy were sensitized to birch pollen. Sensitization to nCor a 9, rCor a 14, or both was strongly associated with hazelnut allergy with objective symptoms. IgE levels to either nCor a 9 of ≥1 kUA/L or rCor a 14 of ≥5 kUA/L in children had a sensitivity of 83% and a specificity of 93%. In adults, the combination of IgE to either nCor a 9 or rCor a 14 of ≥1 kUA/L had a specificity of 98%.

CONCLUSIONS. Sensitization to Cor a 9 and Cor a 14 is specific for patients with objective symptoms in DBPCFCs to hazelnut.

REVIEWER COMMENTS. IgE-specific food allergy testing has been plagued by poor specificity, resulting in many patients being incorrectly labeled food allergic. Component testing as demonstrated in this study may improve specificity for certain foods. As the authors note, food challenges are still needed to confirm tolerance, but component testing may allow additional patients to proceed to food challenge. Patient’s sensitivities to specific components have been shown to vary regionally. When treating diverse patient populations, we must consider these possible regional variations.

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Factors Associated With Reported Food Allergy Tolerance Among US Children

PURPOSE OF THE STUDY. The goal of this study was to investigate factors associated with development of tolerance to 9 common food allergens.

STUDY POPULATION. The study population included 40,000 households with children in the United States.

METHODS. A randomized, cross-sectional survey was completed by eligible adult caregivers regarding a child in the home. Allergies to the 9 most frequently reported current and outgrown food allergens (milk, peanut, shellfish, tree nut, egg, fish, wheat, soy, and sesame) were analyzed. Data regarding the age of first reaction, age at which the allergy was outgrown, and severity of the reaction (mild, moderate, or severe) were obtained.
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