

Low Rates of Tree Nut Allergy in Peanut-Allergic Patients

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Practice Options from Beyond Our Pages focuses on identifying, critiquing, and placing into context research studies published in other journals that have the potential to change our clinical practices. It is written by Allergy-Immunology Fellows partnered with faculty members, and does not require an invitation for submission. This feature is coordinated by Editorial Board members Matthew Rank, MD and Julie Wang, MD.

REFERENCE

Couch C, Franxman T, Greenhawt M. Characteristics of tree nut challenges in tree nut allergic and tree nut sensitized individuals. *Ann Allergy Asthma Immunol* 2017;118:591-6.

BACKGROUND

The prevalence of food allergy has increased in the United States in recent years. This, in turn, has led to increased referrals as well as increased testing for peanut and tree nut (TN) allergies. An understanding of the rate of coincidental allergy between peanut and TNs and between individual TNs is needed to appropriately diagnose and counsel these patients regarding food avoidance.

Although the prevalence of TN allergy in the United States is estimated at around only 1% in the general population,¹ sensitization and clinical reactivity occur more frequently in peanut-allergic patients. Addressing potential TN allergy in these patients can be complex, and the practice parameters on food allergy suggest using an individualized approach.² As such, it is common practice to routinely screen peanut-allergic children for cosensitization to TNs.

A recent retrospective study performed by Elizur et al³ showed that many patients diagnosed with multiple food allergies eliminated foods without a clinical history of reaction. Only 14.5% of the children who eliminated TNs had a previous reaction and many eliminated all TNs because of fear of cross-contamination.

METHODS

Couch et al performed a retrospective chart review of all TN food challenges at a tertiary care center. A total of 156 TN challenges were reviewed. The outcome of the food challenges, patient characteristics, available skin test and sIgE data, and timing of challenges were recorded.

Multiple subgroups were specifically reviewed including patients sensitized to TN without a clinical history of reaction, and patients

with a clinical history of reaction to at least 1 TN but challenged to a different TN to which the patient was sensitized but had no previous history of ingestion. They also reviewed the challenges performed in patients with concomitant peanut allergy.

RESULTS

The overall pass rate was 86% for all TN challenges. The pass rate in the group of TN-sensitized patients was 91%, and the pass rate in the group with a history of other TN allergy was 76%. In children with a true peanut allergy, the pass rate was 96% in patients challenged to a TN to which they were sensitized but had no history of ingestion. The 50% negative predictive value (NPV) for all subjects and all TNs was identified at a wheal size of approximately 8 mm and a specific IgE level of just over 11 kUA/L. When specific TNs were evaluated, the 50% NPV was identified at a wheal size of approximately 6.5 mm for walnut, 11 mm for pistachio, 4.5 mm for pecan, and 5.5 mm for hazelnut.

Critical appraisal

The 50% NPVs for food challenge have been established for some of the most common allergens such as milk, egg, and peanut. This retrospective study aimed to help fill in some of the current knowledge gaps by identifying these cutoff values for the various TNs.

These findings suggest that the pass rates for many of the TNs may be higher than expected for a given skin prick wheal size or specific IgE level. Although previous literature has suggested that up to 34% of peanut-allergic children will have concomitant TN allergy, this study found that 96% of the TN challenges performed in peanut-allergic children were passed.

The generalizability of this study is limited by patient selection. In this retrospective study, a large proportion of patients had either small skin prick test wheal (<3 mm) and/or low specific IgE level (<2 kUA/L) to the TN in question. Another consideration is that all food challenges were performed with TNs to which the patient had no clinical history of reaction and were previously avoiding on the basis of positive testing alone. If the 50% NPVs identified in this study were inappropriately considered in the context of a child with a clinical history of reaction, then a provider would underestimate the risk of a reaction. A child with a convincing history of an allergic reaction to a specific TN who then demonstrates positive testing has a higher likelihood of a true IgE-mediated allergy to that TN. Thus, the 50% NPVs must be interpreted only in the appropriate context and the cutoff is likely lower in children with a history of a clinical reaction.

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Conflicts of interest: The authors declare that they have no relevant conflicts of interest.

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Scenario	Recommendation
Peanut-allergic	Strongly consider not screening for TN allergy if no history of clinical reaction
TN sensitized with no history of clinical reaction to TNs	Strongly consider offering oral food challenge
Allergic to at least 1 specific TN	Strongly consider offering oral food challenge to any other TNs to which the patient is sensitized but has no history of exposure

Several other factors limit the generalizability. This includes the single site location and the retrospective nature (physicians may have elected to perform only low-risk challenges). In addition, it would be assumed that TN challenges conducted in the TN-allergic patients were not performed with highly cross-reactive ones (such as pecan challenge in patient with a history of reaction to walnut); however, this was not explicitly stated in the article.

The article states that the pass rates were significantly higher in this study as compared with those in a previous study by Fleischer et al.⁴ It is noted that the pass rate in the Fleischer et al study was only 45%. However, their comparison was made to the subgroup in which there was a history of previous clinical reaction to the specific TN evaluated by oral challenge. In fact, the subgroup of patients in the Fleischer et al study who did not have a clinical history of reaction but were identified by positive testing (19 total challenges) had a pass rate of 74%, which is comparable to the findings in this study. Again, this demonstrates the importance of clinical history when determining the pretest probability of a patient passing an oral food challenge.

A similar retrospective review from the United Kingdom⁵ showed that among a group of 94 patients with peanut allergy, 22 had positive skin prick testing to 1 or more TNs. The pass rate was 68.8% using a mixed nut challenge (containing brazil nut, almond, hazelnut, cashew, and walnut).

RECOMMENDATION

Based on this study, there are several patient populations in which physicians should consider how to evaluate a possible TN allergy to minimize unnecessary food avoidance. We would recommend the following on the basis of results previously discussed.

In particular, the article calls into question the common practice of allergy testing to TNs in children with a clinical history of peanut allergy as well as the routine practice of instructing patients with peanut allergy to also avoid TNs. When providers decide whether to screen peanut-allergic patients for TN allergy without history of ingestion, multiple factors should be considered.⁶ This may include the potential benefits of an expanded diet, the potential risk for cross-contamination of foods, the potential difficulty in reliably identifying specific TNs,⁷ the time and resources required for subsequent evaluation with food challenges in patients who demonstrate positive test results, and parental comfort with the introduction of new foods at home. The potential risk of unnecessary avoidance leading to clinical allergy or the theoretical benefit of preventing allergy with ongoing exposure should also be considered.

If providers make the decision to test peanut- or TN-allergic patients for other TN allergy, they should be prepared to offer oral food challenges even if the test result is positive.

The significant selection bias in this study should be considered when interpreting the NPV of the oral food challenges for TNs. This includes the selection of only those patients without clinical history of reaction to the specific TN being evaluated, and the selection of mostly “low-risk” patients with relative small wheal size and low specific IgE levels. On the basis of this article, we suggest that all patients labeled with TN allergy be offered the opportunity to safely introduce the foods that have not caused previous reactions.

REFERENCES

1. Sicherer SH, Munoz-Furlong A, Godbold JH, Sampson HA. US prevalence of self-reported peanut, tree nut, and sesame allergy: 11 year follow-up. *J Allergy Clin Immunol* 2010;125:1322-6.
2. Sampson HA, Aceves S, Bock SA, James J, Jones S, Lang D, et al. Food allergy: a practice parameter update—2014. *J Allergy Clin Immunol* 2014;134:1016-25.
3. Elizur A, Bollyky JB, Block WM. Elimination diet and the development of multiple tree-nut allergies. *Pediatr Res* 2017;82:671-7.
4. Fleischer DM, Conover-Walker MK, Matsui EC, Wood RA. The natural history of tree nut allergy. *J Allergy Clin Immunol* 2005;116:1087-93.
5. Ball H, Luyt D, Bravin K, Kirk K. Single nut or total nut avoidance in nut allergic children: outcome of nut challenges to guide exclusion diets. *Pediatr Allergy Immunol* 2011;22:808-12.
6. Brough HA, Turner PJ, Wright T, Fox AT, Taylor SL, Warner JO, et al. Dietary management of peanut and tree nut allergy: what exactly should patients avoid? *Clin Exp Allergy* 2015;45:859-71.
7. Hostettler TL, Hostettler SG, Phillips G, Martin BL. The ability of adults and children to visually identify peanuts and tree nuts. *Ann Allergy Asthma Immunol* 2012;108:25-9.

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