
Correspondence

THE ROLE OF COMPONENT-RESOLVED TESTING IN FOOD ALLERGY AND ORAL ALLERGY SYNDROME

To the Editor: Drs Webber and England¹ are to be congratulated for a comprehensive review of oral allergy syndrome (OAS). In addition to describing the typical oral-pharyngeal symptoms, these authors reveal that 8.7% of patients experience systemic symptoms outside the gastrointestinal tract and 1.7% experience anaphylactic shock. It is a diagnostic challenge to distinguish patients limited to oral symptoms from those who may develop a systemic reaction based on the percutaneous skin tests (PSTs) and ImmunoCAP radioallergen sorbent tests (RASTs) available to most clinicians.

As an example, among peanut sensitive patients, symptoms are more likely to be limited to OAS if the sensitivity is to the heat labile PR-10 homologue Ara h8 compared with a greater risk of systemic reaction if the sensitivity is to the heat and proteolysis stable seed storage protein Ara h2. Although safer than an oral food challenge, PSTs and ImmunoCAP RASTs use a heterogeneous mixture of nonallergenic and allergenic molecules,² panallergens, and food-specific allergens. The mixture of antigens limits the capacity of conventional diagnostic tools to appropriately assess the risk of systemic reaction.

A promising diagnostic technique defines immunodominant IgE epitopes using recombinant peptides.³ Microassay component-resolved testing, as demonstrated by Nicolaou et al,⁴ illustrated that among patients with a positive RAST or PST result who may be sensitive to Ara h8, those likely to fail a food challenge were sensitive to the peanut component Ara h2. A similar strategy may be applied to other food and environmental sensitivities.

We believe the state-of-the-art review by Drs. Webber and England would benefit from a discussion of this promising diagnostic technique. Component-resolved analysis provides allergists with a diagnostic tool to distinguish patients with OAS from those who may develop a systemic reaction. Although Food and Drug Administration approval is pending, the diagnostic potential and clinical implications merit inclusion in a literature review of OAS.

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1. Webber CM, England RE. Oral allergy syndrome: a clinical, diagnostic, and therapeutic challenge. *Ann Allergy Asthma Immunol*. 2010;104:101–108.
2. Asero R, Ballmer-Weber BK, Beyer K, et al. IgE mediated food allergy diagnosis: current status and new perspectives. *Mol Nutr Food Res*. 2007;51:135–147.
3. Steckelbroeck S, Ballmer-Weber BK, Vieths S. Potential, pitfalls, and prospects of food allergy diagnostics with recombinant allergens or synthetic sequential epitopes. *J Allergy Clin Immunol*. 2008;121:1323–1330.

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4. Nicolaou N, Poorafshar M, Murray C, et al. Allergy or tolerance in children sensitized to peanut: prevalence and differentiation using component-resolved diagnostics. *J Allergy Clin Immunol*. 2010;125:191–197.

Author Response: Drs Thompson and Kroker provide a thoughtful discussion of component-resolved diagnostics (CRD) and oral allergy syndrome (OAS). CRD is largely an in vitro diagnostic technique that uses purified natural or recombinant allergen molecules to test for specific IgE to individual allergic components of each allergen in question.^{1,2} The patient's specific IgE subpopulation can then be correlated with different clinical outcomes.¹ This technique has largely been studied within class 1 food anaphylaxis, examining associations with anaphylactic severity and distinguishing anaphylaxis from asymptomatic sensitization.³ For example, Nicolaou et al⁴ used microarray CRD to determine that the peanut component Ara h 2 was the most important predictor of clinical allergy as opposed to sensitization. With additional research, CRD may provide a significant diagnostic testing advantage for class 1 food allergy.

Specific to OAS, as CRD continues to develop it may eventually help distinguish patients clinically limited to typical oral-pharyngeal symptoms (whose IgE subpopulation may consist of more labile proteins) from those who may progress to systemic symptoms, including anaphylactic shock (who may have more stable proteins similar to a class 1 food allergy). Testing OAS patients for specific PR-10 vs lipid transfer protein components may help the practicing physician with therapeutic decision-making, provided the components correlate to different clinical outcomes.^{5,6} CRD may also be the key to settling the debate regarding OAS's true definition, as discussed in our review article.⁷

However, the role of CRD in OAS is still in its infancy, in part due to difficulties similar to those experienced when diagnosing OAS with commercial skin prick testing.⁷ Class 1 food allergens often occur as sequential (linear) and conformational (discontinuous) IgE epitopes, whereas OAS class 2 food allergens have been suggested to consist of more conformational IgE epitopes.³ Studies on conformational IgE epitopes are more challenging than sequential epitopes because conformational proteins can be partially or completely unfolded and might not be properly modified after translation.³ As a result, CRD in class 1 food allergy may flourish ahead of class 2 food allergy, which would delay its use as a diagnostic tool in OAS.

We thank Drs. Thompson and Kroker for their discussion on CRD and how these techniques may influence the future of OAS. They have helped to highlight the differences between OAS and traditional food anaphylaxis and have recognized the efforts being made to resolve the clinical challenges unique to OAS. OAS truly is a diagnosis that is actively being shaped in the

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