Ana o 3 sIgE and diagnostic algorithms reduce cost of cashew allergy diagnosis in children compared to skin prick test: a cost comparison analysis

Tim Brettig[1], Kim Dalziel[2], Jennifer Koplin[1], Thanh Dang[1], Lars Lange[3], Vicki Mc William[1], Sakura Sato[4], Savvas Savvatianos[5], and Kirsten Perrett[1]

[1]Population Allergy Group Murdoch Children's Research Institute Parkville Australia
[2]Health Economics Unit Centre for Health Policy The University of Melbourne Victoria Australia
[3]St Marien-Hospital Bonn Bonn Germany
[4]Clinical Research Center for Allergy and Rheumatology National Hospital Organization Sagamihara National Hospital Kanagawa Japan
[5]Allergy Department 2 nd Pediatric Clinic University of Athens Greece

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Abstract

Background: In the absence of a clear clinical history of reaction, diagnosis of cashew allergy using skin prick tests (SPT) or cashew-specific IgE requires a high number of oral food challenges (OFC). By using Ana o 3 sIgE alone, or a two-step diagnostic algorithm using cashew sIgE followed by Ana o 3 sIgE, there is a reduced need for OFC. We aimed to perform a cost comparison for both of these approaches compared to cashew SPT alone. **Methods:** Pooled individual level data from 6 studies was used to determine diagnostic accuracy and OFC rate. Two studies used cashew SPT (n=567, 198 allergic), with 95% positive and negative predictive values of [?]12mm and <3mm. Four studies were included in the pathways for Ana o 3 sIgE alone or a 2-step algorithm incorporating cashew and Ana o 3 sIgE (n=271, 156 allergic). Cut-offs used were [?]8.5kUA/L and [?]0.1kUA/L for cashew sIgE and [?]0.35kUA/L and [?]0.1kUA/L for Ana o 3 sIgE. Costs were constructed based on unit prices from hospital inpatient admissions, expenses incurred by families, individual patient data on allergic reaction types and rates and adrenaline autoinjector carriage, applying a health system perspective. **Results:** Modelled data through the Ana o 3 pathway resulted in a 46.43% cost reduction (\euro307,406/1000 patients) compared to using cashew SPT alone (\euro573,854/1000 patients). The 2-step algorithm resulted in a 44.94% cost reduction compared to SPT alone (\euro315,952.82/1000 patients). Both the Ana o 3 pathway and 2-step algorithm resulted in a 79-80% reduction in OFCs compared to SPT. **Conclusions:** Using Ana o 3 as a standalone test for cashew allergy diagnosis or a 2-step algorithm incorporating cashew sIgE and Ana o 3 sIgE is accurate and results in a large reduction in both OFCs and health system costs compared to cashew SPT alone.

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