Assessment of sIgE to rLep d 2 for Detecting Lepidoglyphus destructor Sensitization

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Conclusion: The novel recombinant allergen rLep d 2 exhibits excellent specificity, although its sensitivity is lower compared to specific IgE tests and skin prick tests using Lepidoglyphus destructor. Its additional diagnostic utility for respiratory allergies related to L. destructor is minimal.

To the Editor:

Recently, rLep d 2 has been introduced to diagnose IgE-mediated allergy to Lepidoglyphus destructor. We aimed to analyze the sensitivity, specificity, and likelihood ratios of sIgE against rLep d 2.

We retrospectively analyzed 95 sera of patients previously diagnosed with respiratory allergy to L destructor, to whom an IgE determination of L destructor had been requested. The protocol was approved by the Hospital Ethics Committee for Clinical Research (PI 2023/09/1425). Material and methods are specified in Supplementary material.

Statistically significant differences were found between patients sensitized and not sensitized to L destructor. Patients with a sIgE positive to L destructor were younger, had a higher percentage of asthma and moderate/severe persistent rhinitis, and had higher levels of total IgE and sIgE to rLep d 2 and rDer p 2 than non-sensitized patients. (Table 1).

There was a high correlation between L destructor and rLep d 2 (R=0.940, p<0.001), although no correlation was observed between L. destructor and r Der p 2 (R= 0.117, p= 0.260) (Figure S1).

The sensitivity of sIgE to rLep d 2 was 71.64% (95% CI, 59.31-81.99), and specificity was 96.43% (95% CI, 81.65-99.91). PLR was 20.06 (95%CI, 2.91-138.28) and NLR 0.29 (95% CI, 0.20-0.43). The Receiver Operating Characteristic (ROC) curve for sIgE to rLep d 2 had an area under the curve of 0.931 (Figure S2). The results of the patients’ test are summarized in Figure 1.

This is the first study to examine the accuracy of the commercially available major allergen rLep d 2 in a population of patients allergic and non-allergic to L destructor with rhinitis and/or asthma. Good sensitivity (71.64%), excellent specificity (96.43%), remarkable PLR (20.06) and NRL (0.29), and a noteworthy ROC result (0.931) were observed.

Data analysis showed a high correlation between sIgE to rLep d 2 and sIgE to L destructor (0.94) (Figure S1A), much higher than that previously obtained by Johansson et al. (1), who used a non-commercial recombinant extract of Lep d 2, finding a correlation coefficient of 0.70. Additionally, the lack of correlation between sIgE to rDer p 2 and sIgE to L destructor, with a correlation coefficient of 0.117 (Figure S1B),
agrees with the lack of cross-reactivity between group 2 allergens of \textit{L destructor} and \textit{D pteronyssinus} (2). Therefore, most patients who test positive for rLep d 2 and rDer p 2 can be considered co-sensitized.

The sensitivity and specificity data for sIgE to rLep d 2 indicate that a positive result suggests sensitization to \textit{L. destructor}. In contrast, a negative result does not necessarily rule out sensitization, as almost 30\% of patients can still be sensitized to \textit{L destructor}. The PLR of 20.06 provides robust evidence for \textit{L destructor} allergy when rLep d 2 values are \(\geq 0.35\) kU/L. However, it is noteworthy that the ability to exclude \textit{L destructor} allergy is weaker when rLep d 2 values fall below that threshold.

Patients’ test results (Figure 1) suggest that both SPT and sIgE should be used when evaluating a patient with suspected allergy to \textit{L destructor}. In addition, 19 patients had sIgE positive to \textit{L destructor} but negative sIgE to rLep d 2. It could happen that some patients may have been sensitized to allergens other than Lep d 2. Accordingly, rLep d 2 should not be initially used when evaluating a patient with a suspected allergy to \textit{L destructor}. Notwithstanding, sIgE against Lep d 2 might be helpful before initiating specific immunotherapy with \textit{L destructor} (3).

To conclude, despite an excellent specificity, determining sIgE to rLep d 2 does not seem to offer additional diagnostic value when compared SPTs and/or sIgE to \textit{L destructor}.

REFERENCES


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