

Symptom Severity and Allergen-specific IgE in Allergic Rhinitis

Giorgio Ciprandi

Internal Medicine Department, IRCCS AOU San Martino, Genoa, Italy

Received: 22 May 2016 ; Accepted: 5 June 2016

EDITOR

We read with great interest the article of Yadzir et al.¹ We would like to underline some adjunctive topics in favor of serum allergen-specific IgE (sIgE) assessment in AR patients management.

Component resolved diagnostics (CRD) is particularly useful in AR management to correctly define real allergy, so to prescribe the causal allergen for AIT. We would like to remark another important consideration: polysensitization should not be an obstacle for AIT prescription. There is a belief that AIT is contraindicated in polysensitized patients, but a series of studies evidenced that AIT (with 1-2 allergen extracts) may be effective in polysensitized patients.² The reason is that thorough allergy work-up, including sIgE assay, usually allows the causal allergen(s) to be defined.

Another important topic concerns the predictive value of sIgE in detecting AIT responders before AIT starting. As AIT is a prolonged and expensive treatment, a predictive biomarker of responsiveness could be useful. A first study, conducted by Di Lorenzo et al., demonstrated that the ratio of total IgE/sIgE could predict successful AIT.³ Later, two studies confirmed this hypothesis both in allergic children⁴ and adults.⁵ These studies defined a cut-off value of sIgE able to predict AIT responders.

Keywords: Allergic rhinitis; Allergen-specific IgE; Serum, Symptoms; Visual analog scale

Corresponding Author: Giorgio Ciprandi, MD;
Internal Medicine Department, IRCCS AOU San Martino, Genoa
Largo R. Benzi 10, 16132 Genoa, Italy. Tel: (+ 3910) 3533 8120,
Fax: (+ 3910) 3538 664, E-mail gio.cip@libero.it

We would like to discuss a final aspect about the clinical relevance of sIgE assessment: the correlation between sIgE and symptom severity. This topic was addressed by several studies, but rarely using CRD⁶⁻⁹. A recent study reported that Bet v 1 allergic patients with pollen-food syndrome had higher sIgE levels than patients without it.¹⁰ This outcome suggested that sIgE might be correlated with allergy severity.

On the basis of this background, we would like to stimulate the discussion on this issue reporting our experience that aimed at correlating serum specific-IgE levels with symptom severity perception assessed by visual analogue scale (VAS) in a group of AR patients with Bet v 1 allergy.

We retrospectively evaluated file records of 115 AR patients (53 males and 62 females; median age: 40.9 years). Serum levels of allergen-specific IgE to Bet v 1 were detected by the Fluoroenzymeimmunoassay (ImmunoCAP Thermo Fisher Scientific, Italy) in peripheral blood samples and expressed as kUA/L. Symptom severity was assessed by AR patients using VAS. The VAS was a segment of 10 cm, where the patient indicated the perception of AR symptoms by marking a point: 0 implied the absence of symptoms while 10 corresponded to the worst perception. The cut-off 6 could remark mild to moderate-severe symptoms. The patients were visited in the autumn before AIT prescription and the VAS assessment concerned the symptoms perceived in the past pollen season. Patients gave a written informed consent and the procedure was approved by the Review Board.

The statistical analysis was performed using box and whisker plot and Pearson's test. Data were reported as median and interquartile range (IQR) and analyzed using Stata statistical package version 13.1 (Stata Corp,

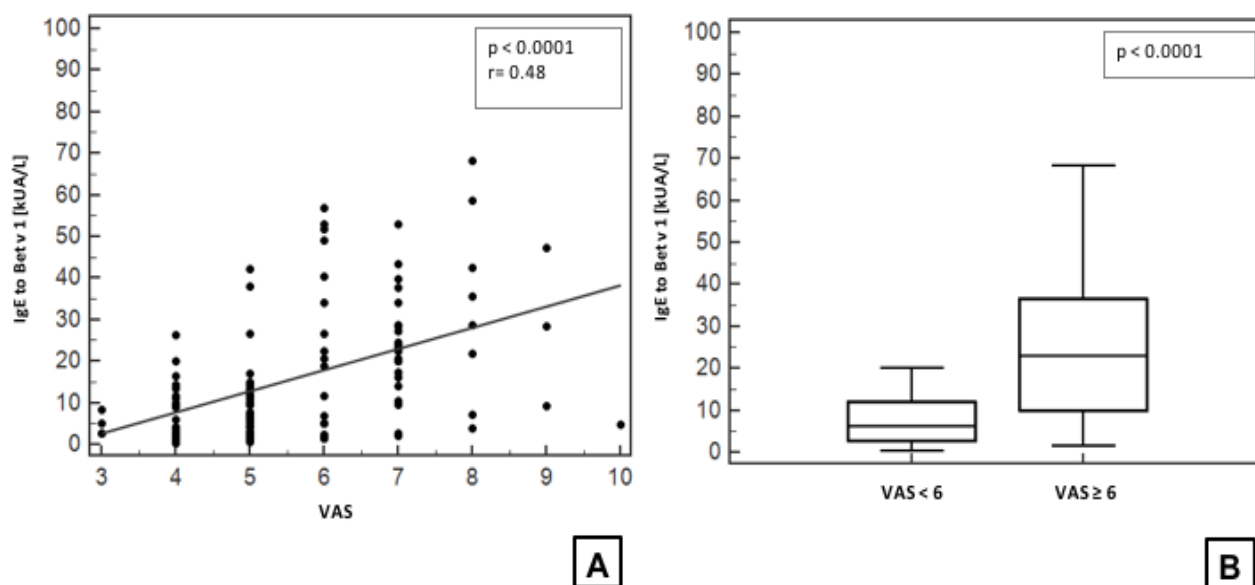


Figure 1. A: Correlation between sIgE to Bet v 1 (kUA/L) and visual analogue scale (VAS) scores in allergic rhinitis (AR) patients. B: sIgE to Bet v 1 in AR patients with VAS scores <6 and ≥6 in the same patients.

College Station, TX., USA).

There was a moderate correlation ($r=0.48$; $p<0.0001$) between serum IgE levels and VAS scores (Figure 1A). Patients with VAS scores ≥ 6 had significantly higher ($p<0.0001$) serum IgE levels (md=23.0; IQR=25.8) than patients with VAS scores <6 (md=6.4; IQR=9.1), as shown in Figure 1B.

The main finding of our experience is that the presence of elevated levels of sIgE is associated with severe AR symptoms and there is a moderate correlation between sIgE and VAS.

Therefore, these findings show that serum sIgE level might be a reliable biomarker also for suggesting more severe symptoms in AR patients. This outcome might be clinically relevant, particularly in candidates for immunotherapy. In fact, AIT usually is considered in patients with moderate-severe AR and refractory to medications.

In conclusion, we believe that sIgE assessment, mainly concerning CRD, should be included in a careful allergy work-up.

ACKNOWLEDGEMENTS

We are grateful to Francesca Ferrero (IRCCS San Martino) for data analysis.

REFERENCES

1. Yazdir ZHM, Bakhtiar F, Misnan R, Abdullah N, Leecyous B, Murad S. Improved diagnosis of the polysensitized allergic rhinitis patients using component resolved diagnosis method. *Iran J Allergy Asthma Immunol* 2016; 15(2):156-60.
2. Ciprandi G, Incorvaia C, Puccinelli P, Soffia S, Scurati S, Frati F. The polysensitization as a challenge for the allergist: the suggestions provided by the POLISMAIL studies. *Expert Opin Biol Ther* 2011; 11(6):715-22.
3. Di Lorenzo G, Mansueto P, Pacor ML, Rizzo M, Castello F, Martinelli N, et al. Evaluation of serum s-IgE/total IgE ratio in predicting clinical response to allergen-specific immunotherapy. *J Allergy Clin Immunol* 2009; 123(5):1103-10.
4. Tosca MA, Silvestri M, Accogli A, Rossi GA, Ciprandi G. Serum specific IgE and allergen immunotherapy in allergic children. *Immunotherapy* 2014; 6(1):29-33.
5. Ciprandi G, Silvestri M. Serum specific IgE: a biomarker of response to allergen immunotherapy. *J Invest Allergol Clin Immunol* 2014; 24(1):35-9.
6. Burrows B, Martinez FD, Halonen M, Barbee RA, Cline MG. Association of asthma with serum IgE levels and skin-test reactivity to allergens. *N Engl J Med* 1989; 320(5):271-7.
7. Sunyer J, Anto JM, Sabria J, Roca J, Morell F,

Symptom Severity and Allergen-specific IgE in Allergic Rhinitis

- Rodriguez-Roisin R, Rodrigo MJ. Relationship between serum IgE and airway responsiveness in adults with asthma. *J Allergy Clin Immunol* 1995; 95(3):699-706.
8. Chen ST, Sun HL, Lu KH, Lue KH, Chou MC. Correlation of immunoglobulin E, eosinophil cationic protein, and eosinophil count with the severity of childhood perennial allergic rhinitis. *J Microb Immunol Infect* 2006; 39(3):212-8.
9. Rolinck-Werninghaus C, Keil T, Kopp M, Zielen S, Schaurer U, von Berg A, et al. Specific IgE serum concentration is associated with symptom severity in children with seasonal allergic rhinitis. *Allergy* 2008; 63(10):1339-44.
10. Ciprandi G, Comite P, Ferrero F, Bignardi D, Minape P, Voltolini S, Troise C, Mussap M. Birch allergy and oral allergy syndrome: the practical relevance of serum IgE to Bet v 1. *Allergy Asthma Proc* 2016; 37(1):43-9.