

LETTER TO THE EDITOR

**COMPARISON OF SERUM SPECIFIC IGE AND SKIN PRICK TEST IN
POLYSENSITIZED PATIENTS.**G. CIPRANDI, M. DE AMICI¹, V. GIUNTA¹ and G.L. MARSEGLIA¹

Department of Internal Medicine, Azienda Ospedaliera Universitaria San Martino, University of Genoa, Genoa; ¹Foundation IRCCS San Matteo, Department of Paediatric Science, University of Pavia, Italy

Received May 18, 2010 – Accepted November 4, 2010

The aim of this study is to evaluate serum specific-IgE in a large group of polysensitized patients with the same SPT result (such as +++) comparing two diagnostic methods. Six hundred ten patients (310 females; median age 32 years) suffering from allergic rhinitis were studied. Serum specific-IgE were measured by ImmunoCap assay. Skin prick test was also performed. There was a significant difference between serum specific-IgE values in these polysensitized patients. In conclusion, the serum specific-IgE measurement in polysensitized patients seems to be more appropriate than SPT.

Skin prick test (SPT) and serum specific IgE (ssIgE) measurement are the most common methods used to diagnose allergy. SPT has been well standardized and is considered by many allergists as first line. Previous studies demonstrated that there is a strong relationship between the two tests, even though there is currently no single gold standard test for diagnosing respiratory allergy (1). In addition, SPT may be assessed on the basis of skin response to histamine, and positivity is usually expressed using a 5 point scale (0 = negative, +++ = response equal to histamine, ++++ = larger response) (1). On the other hand, polysensitization is very frequent in allergic patients: in fact, > 80% of them are sensitized to more allergens (2). Therefore, in clinical practice it is very common to observe polysensitized patients with the same degree of SPT results. Thus, it may become difficult to manage these patients. Instead, ss-IgE assessment allows a standardized quantitative measurement that is expressed with absolute number

from 0 to 100 and with two decimals. ImmunoCAP is the assay that has been most extensively studied.

The aim of this study is to evaluate ss-IgE in a large group of polysensitized patients with the same SPT result (such as +++) comparing the two methods.

MATERIALS AND METHODS

Six hundred ten patients (310 females; median age 32 years) suffering from allergic rhinitis, diagnosed according to validated criteria (3), were consecutively enrolled. All of them were evaluated when symptomatic. SPT was performed and assessed according to the EAACI Position Paper (1). Inclusion criteria were SPT positive to 8 allergens with the highest grade (++++) and diagnosis of allergic rhinitis. The study was approved by the Ethics Committee of Foundation San Matteo.

Skin prick test was performed as stated by the European Academy of Allergy and Clinical Immunology (4). The panel consisted of: house dust mites (*Dermatophagoides*

Key words: skin prick test, serum IgE, allergens, polysensitization

Mailing address: Giorgio Ciprandi, M.D.

Semeiotica e Metodologia Medica I,

DIMI,

Viale Benedetto XV 6,

16132 Genoa, Italy

Tel: ++39 010 35338120 Fax: ++39 010 3538664

e-mail gio.cip@libero.it

0394-6320 (2010)

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farinae and *pteronyssinus*), cat, dog, grasses mix, *Compositae* mix, *Parietaria officinalis*, birch, hazel, olive tree, *Alternaria tenuis*, *Cladosporium*, *Aspergilli* mix (Stallergenes, Milan, Italy).

Ss-IgE were measured by ImmunoCAP (Phadia) fluoroenzymeimmunoassay. Values were expressed as kU/L. 0.35 kU/L was considered a cut-off value for positivity. Parameters were reported as medians (MD) with interquartile range (IQR). Analysis of variance was performed with Kruskal-Wallis's test; Wilcoxon's test was used for *post-hoc* comparisons.

RESULTS

Ss-IgE concentrations significantly differed among the seasonal allergens ($p < 0.0001$, Kruskal-Wallis test; Fig. 1a). In particular, Ss-IgE concentrations were different between birch (MD: 8.96 kU/L, IQR: 2.5-20.7 kU/L) and grasses (MD: 12.8 kU/L, IQR: 2.4-41.1 kU/L; $p < 0.0001$) and *Compositae* (MD: 4.4 kU/L, IQR: 1.1-17.7 kU/L; $p = 0.0003$). The comparisons between *Compositae* and *Parietaria* (MD: 9.1 kU/L, IQR: 2.8-28.5 kU/L) and grasses showed a significant difference in median serum levels of Ss-IgE ($p = 0.0045$ and $p < 0.0001$, respectively).

Moreover, Ss-IgE concentration significantly differed among the perennial allergens ($p = 0.0001$, Kruskal-Wallis test; Fig. 1b). In particular, Ss-IgE concentrations were different between *Alternaria* (MD: 7.13 kU/L, IQR: 3.5-16 kU/L) and dog dander (MD: 0.7 kU/L, IQR: 0.1-5.1 kU/L; $p = 0.0001$) and cat dander (MD: 1.9 kU/L, IQR: 0.7-10.7 kU/L; $p = 0.0059$). The comparisons between cat dander and dog dander and house dust mites (MD: 5 kU/L, IQR: 0.9-21.6 kU/L) showed a significant difference in median serum levels of Ss-IgE ($p = 0.0307$ and $p = 0.0253$, respectively). Finally, Ss-IgE concentrations significantly differed between house dust mites and dog dander ($p = 0.0002$).

DISCUSSION

It is well known that the diagnosis of allergy is based on the concordance between history and sensitization, such as the demonstration of the link between exposure to sensitizing allergen and symptom occurrence (5). If IgE evaluation is not sufficient for diagnosing allergy, an allergen-specific

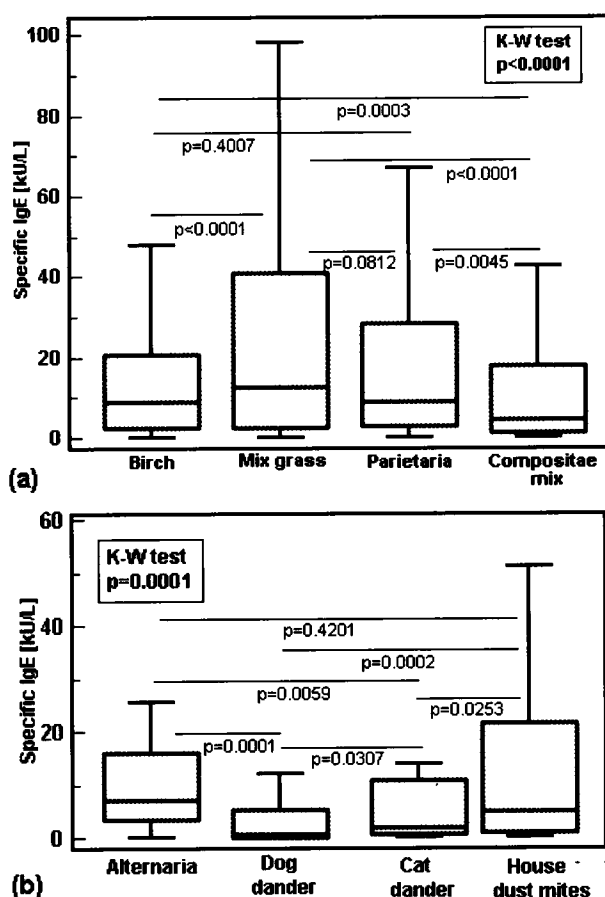


Fig. 1. Ss-IgE concentrations evaluated separately for seasonal (a) and perennial (b) allergens. Concentrations are represented as medians (horizontal lines), quartiles (25th and 75th percentiles, boxes), and ranges (vertical lines) excluding outliers. P-value (Kruskal-Wallis test) and p-values of individual group comparisons (Wilcoxon test) are given in the figure.

challenge may be performed, but this procedure is complex and time-consuming. In addition, it may be an overlapping concerning the pollination period so it is difficult to differentiate the most relevant allergen on the basis of symptom period. Therefore, it would be better to have a consistent IgE assessment.

This study shows that there is a significant difference of serum specific-IgE in this group of polysensitized patients. Thus, serum specific-IgE measurement may significantly improve the diagnostic capability of the clinician. These findings support the relevance of ss-IgE measurement

as it is more precise and quantitatively accurate than SPT. In fact, ss-IgE measurement allows an appreciable difference in values that is not possible by performing SPT.

In this regard, it is to note that all patients were polysensitized with the same skin prick test result, such as +++++. Thus, it is very difficult to define the most relevant causal allergen as the skin prick test is not able to do so. Instead, serum specific-IgE assessment allows to measure the level thus allowing to discriminate the clinical relevance of sensitization. Moreover, polysensitization is a very frequent phenomenon as about $\frac{3}{4}$ of allergic patients are sensitized to more than one allergen (6). This fact might have an impact on the clinical practice concerning the choice of allergen extract for immunotherapy. However, it has been reported that polysensitization has not to be considered an obstacle for prescribing immunotherapy, as recently shown by a Polismail study (7-8) which demonstrates that the ss-IgE measurement in managing polysensitized patients seems to be more appropriate than SPT.

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