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ASSOCIATION LACK BETWEEN RADIOALLERGOSORBENT TEST RESULTS AND SKIN TEST REACTIVITY IN VENOM ALLERGIC PATIENTS

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Abstract:

Specifically analyze the relation between skin test reactivity, venom-specific immunoglobulin E (IgE) antibody levels, and acuteness of scientific reaction in patients with insect venom allergy.

According to the study 36 patients (including 15 females) who awarded the allergic reaction history to insect stings were analyzed. The mean age, according the reaction time was 33.4 ± 15.1 years (range, 4–76 years), similarly, the patients were asessed 43.6 ± 90 months (range, 1–300 months) after the reactions. The score of scientific reactions were scored according to acuteness, from 1 (cutaneous indicators only) to 3 (anaphylaxis with shock). These scores were compared to scores for skin test reactivity (0 to 5, indicating the log increase in sensitivity from 1 µg/mL to 0.0001 µg/mL) and radioallergosorbent test (RAST) "a radioallergosorbent test conducted through blood to perceive particular IgE antibodies and to analyze the substances is allergic or not" levels (0 to 4, indicating venom-specific IgE levels, from undetectable to > 17.5 kilo-units of antigen per liter [kUA/L]).

There was no association observed between skin test reactivity (Spearman's coefficient = 0.15, p =.377) or RAST level (according to Spearman's coefficient = 0.32, p =.061) and the acuteness of reaction. Test of Skin and RAST scores both contrasted promptly from scientific acuteness (p < .05), but there was an important association between skin test reactivity and RAST score (p =.042). There was no association between skin test reactivity and time since reaction (Spearman's coefficient = 0.18, p =.294) nor between RAST and time since reaction (r = 0.1353, p = .438). Patients' elimination tested more than 12 months after their reaction still formed no association between skin test reactivity (p = .681) or RAST score (p =.183) and the acuteness of the scientific reaction.

In venom-allergic patients (in difference to stated outputs in cases of inhalant IgE-mediated allergy), there seems to be no important association between the skin test degree reactivity and venom-specific IgE (determined by RAST) level and the acuteness of the scientific reaction.

Keywords: *Association lack, Radioallergosorbent Test, Skin Test, Venom Allergic Patiests, Reactivity*

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INTRODUCTION:

There is a clear propensity on the a part of patients (and in all probability additionally physicians) to assume that there's a scientific association between (1) the degree of diagnostic test reactivity to substance on body covering or epicutaneous prick testing for immediate hyposensitivity and (2) the extent of scientific responsiveness to it substance. A previous study examined this relationship for inhalant allergens and discovered an association between the acuteness of scientific symptoms and also the degree of take a look at diagnostic test diagnostic assay} reactivity (assessed by the dimensions of the response) or the amount of specific immunoglobulin (IgE) protein(measured by radioallergosorbent test [RAST]). Different studies of venom and food allergies haven't shown such an association.

In this analysis, it's determined that the relation between the higher than parameters for patients with a scientific history of immediate hypersensitivity to venoms of stinging insects by categorizing the scientific acuteness of the reaction to a sting, the amount of diagnostic test reactivity to increasing concentrations of venoms, and specific immunoglobulin levels measured by RAST (Antares, Dermawan and Permata, 2017).

METHOD:

In the study 36 patients who were referred to the Allergy and Scientific Immunology Clinics for possible immunotherapy after having a systemic reaction to an insect sting were assessed. The group contained 15 females, and the mean age was 33.4 ± 15.1 years (4–76 years) (Clark, Levin and Dolen, 2009).

The patients were assessed 43.6 ± 90 months (median, 5.5 months; range, 1–300 months) after the reaction. The patients were assessed in the following parameters:

1. Acuteness and characteristics of the scientific reaction, rated as follows: (a) cutaneous indicators only (hives, pruritus, or peripheral angioedema); (b) upper- or lower-airway obstruction; (c) anaphylaxis with hypotension and shock necessitating resuscitation

2. Time (months) between the scientific reaction and the skin testing and RAST (done at the time of skin testing) (Antares, Dermawan and Permata, 2017);

3. Skin test outputs after intradermal testing with venom in 10-fold dilutions from 1.0 μg/mL (positive-rated 1 on the skin testing scale) to 0.0001 μg/mL (positive rated on the scale of skin testing) results of skin testing were compared to a positive (histamine 1.0 mg/mL) and negative (saline) control, and a positive response had a wheal ≥5 mm and flare ≥ 10 mm (Clark, Levin and Dolen, 2009).

No attempts were carried out by Pharmacia CAP-System RAST, and no patients' agonized from specific gastrointestinal symptoms or cardiac/ respiratory arrest. According to the results, they were considered such as: Negative: 0 (< 0.35 kilounits of antigen per litre [kUA/L]) Low: 1 (0.35–0.70 kUA/L) Medium: 2 (0.7–3.5 kUA/L) High: 3 (3.5–17.5 kUA/L) Very high: 4 (> 17.5 kUA/L) (Dikmen, Bozkuş and Kayım Bilgiç, 2017).

Statistical Analysis

According to the comparison of the 3 parameters (RAST, skin test and scientific acuteness) was performed by Kruskal-Wallis one-way analysis of variance (ANOVA) on ranks, with SigmaStat 2.0 statistical software (Jandel Scientific). Correlation coefficients were determined by Spearman's rank order association, again with SigmaStat software. Power was assessed by PS power and sample size calculation software (Dupont and Plummer, freeware, 1997).

RESULTS:

According to the assessment of 36 patients, 16 had a reaction with only cutaneous indicators, 13 had higher or lower-airway obstruction, and six had anaphylaxis with collapse of cardiovascular. No patient had a particular gastrointestinal symptom. Out of all 27 patients were evaluated within 12 months of their reaction, and the remaining nine patients were seen 14 to 300 months after the reaction to venom (Table 1).

Table 1 Demographics of Patient Population

Number	*Sex*	*Age (yr)*	*Skin Test*	*RAST*	*Clinical Reaction*	*Months since Reaction*
1	F	47	3	4	1	1
2	M	33	3	1	1	2
3	F	14	4	3	2	204
4	M	21	1	2	2	10
5	F	41	0	3	1	2
6	F	49	3	2	1	14
7	M	25	1	3	1	84
8	M	21	4	4	3	1
9	M	4	4	4	3	240
10	F	20	3	3	1	4
11	M	18	2	3	1	5
12	F	23	5	N/A	1	276
13	M	26	3	1	2	2
14	F	33	4	4	2	1
15	F	46	2	2	1	12
16	M	49	4	3	2	30
17	M	59	2	3	2	2
18	F	36	2	3	2	12
19	M	37	3	3	2	18
20	M	28	4	4	1	300
21	F	40	3	3	1	3
22	M	6	3	1	1	3
23	M	33	2	2	1	276
24	F	46	2	3	1	3
25	M	35	2	2	3	6
26	M	41	3	3	3	6
27	F	76	1	4	3	1
28	M	24	4	4	2	1
29	M	16	2	2	2	3
30	F	35	3	2	1	1
31	F	42	3	4	2	2
32	M	29	3	4	2	12
33	M	28	3	1	6	6
34	F	20	3	3	2	2
35	M	46	4	3	1	12
36	M	56	3	4	3	12

RAST = radioallergosorbent test.

(Source: (Dikmen, Bozkuş and Kayım Bilgiç, 2017)

According to the determination by the system of scoring as mentioned previously, the mean score for skin tests was 2.806 ± 1.064 standard deviation (Standard Deviation); the mean score for RAST was 2.857 ± 0.974, and the mean score for scientific acuteness was 1.833 ± 1.028. By ANOVA, the skin test score was promptly different from the scientific acuteness score ($p < .05$, power = 0.988) (Dikmen, Bozkuş and Kayım Bilgiç, 2017).

The RAST score was also promptly different from the scientific acuteness score ($p < .05$, power = 0.996). However, the RAST score did not differ promptly from the skin test score ($p > .05$). As determined by Spearman's rank order association for data not normally distributed, there was a important association between skin test score and RAST score ($r = 0.346$, $p = .042$, power = 0.626) but no association between scientific acuteness and either skin test score ($r = 0.0957$, $p = .576$) or RAST score ($r = 0.246$, $p = .152$). There was no association between skin test reactivity and time since reaction ($r = 0.18$, $p = .294$) or RAST score and time since reaction ($r = 0.183$, $p = .438$). Even if patients who were tested more than 12 months after their reaction were excluded, there was still no association between skin test reactivity ($p = .681$) or RAST score ($p = .183$) and the acuteness of the scientific reaction (Dikmen, Bozkuş and Kayım Bilgiç, 2017).

DISCUSSION:

Recently, there are three approaches by which allergy to venom from stinging insects can be assessed: (1) determination of the scientific acuteness of the reaction, (2) skin tests to measure reactivity, and (3) RAST or CAP System assay to measure specific IgE. From a linear thinking perspective, it might be assess (excluding loss of reactivity with time as a factor) that a association exists between these three parameters; this does not, however, appear to be the case.

Dikmen and colleagues assess skin tests and estimations of specific IgE antibodies by RAST in patients with bee-sting allergy. The output corresponded in 82% of the patients. The RAST and skin test outputs for five venoms in 60 patients with histories of stinging-insect allergy; 48 patients with positive skin test outputs showed an 88% association of RAST and skin test scores. Another research observed that the level of IgE antibody to venom does not reliably reflect the acuteness of the last reaction to a sting in patients with double positive reactivity to stings both from honeybees and from Vespula species. Famous researcher Mosbech, in a comparative study of venom-allergic patients, observed a positive association ($p < .05$) between the outputs of skin-prick tests and specific IgE against venoms. For patients allergic to yellow-jacket stings, there was also a association between the acuteness of symptoms after the sting and the size of the skin-prick test reaction to venom (Dikmen, Bozkuş and Kayım Bilgiç, 2017).

On the contrary, Nittner-Marszalska and colleagues observed that for patients with allergy to the venom of insects of the order Hymenoptera, there was no association between the size of the skin test reaction, the class of venom-specific IgE level (by fluorescent allergosorbent technique [FAST]), and the outputs of basophil histamine release. In addition, no relation was observed between the outputs of these tests and the acuteness of the sting reactions as measured on the Mueller scale (Regan et al., 2017).

In this analysis of 36 patients with immediate hypersensitivity reactions to stinging-insect venoms, no association was observed between the degree of skin test reactivity or RAST score and the acuteness of the scientific reaction. The absence of an important association persisted when individuals who were assessed more than 12 months after their scientific reaction were excluded from the analysis. An association was observed between the degree of skin test reactivity and venom-specific IgE levels measured by RAST (Regan et al., 2017).

The fact that skin test reactivity and specific IgE levels measured by RAST are not predictors of the scientific acuteness of a reaction is apparently not unique to venom allergy. It is also observed that when using quantitative skin-prick tests with an average endpoint allergen concentration of 50 allergen units (AU) on atopic asthmatic patients, the mean wheal diameter was not promptly greater for severely asthmatic patients than for mildly asthmatic patients.

According to those patients with nut allergy, it is observed no association between skin-prick test wheal size and the graded acuteness of the worst reaction for all nuts combined or for peanut, hazelnut, almond, and walnut. For the CAP System specific IgE levels, there was no association for all nuts, so the size of SPT or CAP System levels did not predict between minor urticaria and anaphylaxis (Regan et al., 2017).

These outputs indicate that specific IgE level as assessed by either skin testing or serum IgE is only one determining parameter in the induction of anaphylaxis and that other factors must play a role. Such factors could be mast-cell mass, mast cell stability, concomitant medications, number of stings or amount of venom injected, and levels of blocking antibodies. Although it is tempting to assume so, the size of the skin test reaction to an allergen or the level of specific IgE does not necessarily predict scientific reactivity (Yegin, 2016).

The contrary insights of the abovementioned study researchers assessed 59 asthmatic children by skin-prick tests, RAST (specific IgE), and bronchial provocation with common inhalants. They observed an important connection between the outputs of the three tests. Hence the level of concordance was only moderate, and not higher than 68%. On the other hand with bronchial provocation, prick testing and RAST respectively yielded numerous false-positive and false-negative outputs (Dikmen, Bozkuş and Kayım Bilgiç, 2017).

This is perhaps not surprising, given the problem of allergen sensitization without scientific reactivity and the reduced sensitivity of RAST when compared with skin testing. In this study, the negative predictive value of skin-prick tests was considered satisfactory, and the most discriminatory threshold for the positive RAST output was the class-3 response (Dikmen, Bozkuş and Kayım Bilgiç, 2017).

This would suggest that association between the magnitude of skin-prick tests or RAST and bronchial challenge was not good. Insect-sting challenge of 324 subjects with a previous anaphylactic reaction to yellow-jacket and honeybee stings and observed that a recurrence of anaphylaxis was observed in 25% of those sensitive to yellow-jacket stings and 52% of those sensitive to honeybee stings. Accordingly, the more striking have been found through the study of van Halteren and colleagues, who analyzed that 348 patients, specifically with the past history of anaphylaxis to bites and with mild or no symptoms on in-hospital sting challenge; 129 of these subjects subsequently were accidentally stung in the field, and 110 had only local reactions whereas 6 patients experienced serious indicators. Therefore, previous history of a severe response to a sting is not predictive of a subsequent serious reaction to accidental sting challenge. Meanwhile, two-thirds of individuals who die from a sting reaction have no previous history of their allergy (Dikmen, Bozkuş and Kayım Bilgiç, 2017).

CONCLUSION:

It has been concluded that allergic reactivity is generally a complicated phenomenon that is not explicable merely on the sources of the presence of immunoglobulin E antibodies. The difficulty is to devise approached of determining who among individuals with equivalent levels of sensitization is at risk of a serious reaction.

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