HOUSE DUST ALLERGY IN ATOPIC DERMATITIS PATIENTS IN JEDDAH, SAUDI ARABIA

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ABSTRACT

Atopic dermatitis is a common skin disease that affects a significant proportion of the general population. It has been suggested that an important aggravating factor in atopic dermatitis (AD) may be chronic exposure to environmental house dust. There is controversy as to whether serum IgE levels and RAST reactivity are related to the severity of the disease. It was found that serum IgE levels correlate with the severity of the disease, and 41 out of the 79 patients (52%) had statistically significant RAST reactivity to house dust mixture. It was also clear that serum IgE levels were higher in patients showing specific IgE antibodies against house dust mixture in their serum.

These results indicate that house dust mix. is involved as a triggering as well as an aggravating environmental factor in more than half of the cases of atopic dermatitis in Jeddah, Saudi Arabia.

Keywords: Atopic eczema, House dust, IgE, Specific IgE, RAST.

INTRODUCTION

House dust mixture is a unique allergen, in that it is not a simple substance, but an accumulation of living and non living materials gathered from a particular environment(1). The morphologic components of house dust are fibers, pollens, human and animal dander, food remnants, bacteria, fungal spores(2) and arthropods(3) Stites et al(4) described that house dust mites are present in house dust samples throughout the world but are most prevalent in warm, humid climates. House dust mites (Dermatophagoides spp.) are now recognized as the major source of antigen in house dust mix.(1). Beck and Korsgaard(5) found that people with moderate to severe AD had significantly higher densities of mites in their homes than non-atopics. Barnetson et al(6) also found that patients with atopic eczema improve when admitted to hospital, even when no local treatment is applied to the skin.

Although IgE levels are increased in atopic dermatitis, there is controversy as to whether these levels are related to the extent or severity of disease. Gurevitch et al(7) reported that IgE levels do correlate with the severity of dermatitis, while Stone et al(8) found that there is no correlation between IgE levels and the subjective assessment of the severity of dermatitis.

Total IgE level estimation, Prick test, Provocation test, and RAST reactivity toward given antigens are of diagnostic importance(9). RAST assays as well are of importance as regards therapeutic approach(10) .

Although provocation testing may be highly informative, it is not practical for routine investigations and can be hazardous. Skin prick test and RAST studies correlate variably with each other, depending on the antigen. However from a practical point of view, the decision as to which test should be used depends on availability, cost and discomfort or risk to the patient(9,10) .

PATIENTS AND METHODS

Selection of patients:

A total of 79 (49 males and 30 females) patients with atopic dermatitis diagnosed clinically according to Hanifin and Rajka criteriaís(11) were evaluated by measuring total serum IgE antibody levels and specific IgE antibodies (RAST) to house dust mix. Patients who had other diseases which may cause high serum IgE levels were excluded. The patientís ages ranged between 2-81 years with a mean age of 30 years.

According to the serum IgE antibody levels, patients were classified into Five groups: the first group 10 - 180 U/ml (normal value), the second group 181 - 500 U/ml, the third group 501 - 1000 U/ml 14, the fourth group 1001 - 4000 U/ml 24, and the fifth group had more than 4000 U/ml 9. Each group was divided into RAST negative and RAST positive.

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RAST test results were then correlated to the severity of dermatitis.

Assays for total serum IgE:

Total serum IgE antibody levels were measured by microparticle enzyme immune assay (Abbott, England). Normal values range between 10 and 180 U/ml.

Assays for specific IgE:

Specific IgE antibodies to house dust mix. were measured by the radioallergosorbent test (RAST, JSPS, London). The results were expressed in RAST scores that range from 0 to 6. A score of 2 or more was interpreted as positive.

RESULTS

Out of 79 patients with AD, 41 patients (52%) had positive RAST results to house dust mixture, and out of these patients (49 male and 30 female). Only 3 patients of the total number showed normal IgE levels, and out of those no severe AD was observed, while out of 9 patients who had very high IgE levels (> 4000 U/ml), no patients showed mild form of AD Table (1).

Positive RAST reactions were obtained in 42% of mild cases, 56% of moderate cases, and in 86% of severe cases Table (2).

Table (3) shows the RAST results in relation to the serum IgE levels. Patients with normal IgE levels showed no positive RAST reaction, while patients with very high serum IgE levels (> 4000 U/ml) showed a high percentage of positive RAST reaction.

Table 1. Correlation of total serum IgE levels to the severity of dermatitis in 79 patients.

	Dermatitis severity			
Serum IgE level	Mild	Moderate	Severe	Total No.
10 - 180*	2 (67%)	1 (33%)	0 (0%)	3
181 - 500	16 (55%)	13 (45%)	0 (0%)	29
501 - 1000	9 (64%)	4 (29%)	1 (7%)	14
1001 - 4000	9 (37%)	11 (46%)	4 (17%)	24
> 4000	0	7 (78%)	2 (22%)	9

* Normal value

Table 2. Prevalence of positive RAST reactions to house dust mixture in patients with mild, moderate, and severe atopic dermatitis.

	RAST reactioneaction to house dust mix.			
Dermatitis severity	No. of patients	Positive	Negative	% of positive RAST
Mild	36	15	214	2%
Moderate	36	20	16	56%
Severe	7	6	1	86%

Table 3. Correlation of RAST results to the total serum IgE levels in 79 patients with atopic dermatitis

Serum IgE level	RAST negative (%)	RAST positive (%)	Total No.
10 - 180 *	3 (100%)	0	3
181 - 500	20 (69%)	9 (31%)	29
501 - 1000	7 (50%)	7 (50%)	14
1001 - 400	6 (25%)	18 (75%)	24
> 4000	2 (22%)	7 (78%)	9

* Normal value

DISCUSSION

The study showed no significant differences in the percentage of RAST reactions between male and female noted. The same results were noted in a study conducted by Al-Shalan(12) for patients with allergic rhinitis in Riyadh. These patients underwent prick testing to inhalant allergens including house dust.

Although IgE levels are increased in AD, there is controversy as to whether these levels are related to the extent or severity of the disease. In this study the IgE levels correlated well with the severity of AD, and this agrees with a study done by Gurevitch et al (7).

In the present study we found that house dust mix. allergy plays a significant role in patients with AD, and that positive RAST reactions were observed in more than one half of the patients. Similar findings were reported by Herbert et al(9) in atopic asthmatics and by Norris et al(13) in patients with atopic dermatitis. Other studies from Al-Frayh et al(14) in asthmatic children and Al-Shalan et al(12) in patients with allergic rhinitis the incidence of positive prick test was low in Riyadh. The difference between theirs and our study in the incidence of positive allergy tests to house dust could be due to: (1) The dry climate in Riyadh area where the house dust mites concentrations in house dust samples are low(14), (2) The difference in the test used, where they used prick test while we used RAST.

Regardless of the personal history of asthma and/or rhino-conjunctivitis and/or family history of atopy, RAST reaction to house dust mix. correlated well with the severity of AD, where less than half of the patients with mild AD showed positive reactions, while the majority of patients with moderate and severe AD had positive RAST reactions.

CONCLUSIONS

This study confirmed the importance of measuring serum IgE levels and the detection of house dust mix. specific IgE antibodies in serum of atopic dermatitis patients. It confirmed also that people who live in a warm, humid climate are more susceptible to develop house dust allergy than those who live in a warm dry climate. Individuals showing RAST positive results can be given certain instructions to minimize the exposure to the causative allergens.

ACKNOWLEDGMENT

I am grateful to Mr. Khalid Riyadh, Senior Chief and Laboratory Manager at King Khalid National Guard Hospital for his great help in collecting laboratory results.

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