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Pattern of Aeroallergen Sensitization in Atopic Dermatitis Patients at University Clinic in Jeddah-Saudi

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Author's contribution

This whole work was carried out by the author AAK.

Original Research Article

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ABSTRACT

Aims: To evaluate the pattern of skin prick test results of atopic dermatitis patients.
Study: This was a retrospective study. Data were collected for the results of skin prick tests for atopic dermatitis patients who attended the King AbdulAziz University Medical Services Dermatology clinic in Jeddah Saudi Arabia between October 2010 and November 2012
Results: A total of 63 cases were collected. The rate of sensitization was 85.7% (54 out of 63). Most of them had been sensitized to more than one allergen (77.8%). Most of the patients were sensitized to Dermatophagoides pteronyssinus and Dermatophagoides farina (80% and 74% respectively). Less commonly they were sensitized to cat fur (44%) and to cockroaches (37%).
Conclusion: House dust mite, cats and cockroaches allergens appear to be the most prevalent sensitizers in atopic dermatitis patients in Jeddah region.

Keywords: Atopic dermatitis; aeroallergens; skin prick test.

ABBREVIATIONS

AD: Atopic dermatitis, AR: Allergic rhinitis, AS: Asthma, SPT: skin prick testing.

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1. INTRODUCTION

Atopic dermatitis (AD) is a common skin disease. Several factors are believed to play a role in its pathogenesis [1]. Sensitization to aeroallergens is one of its manifestations like other atopic diseases such as allergic rhinitis and asthma [2]. There is a plethora of studies of allergic sensitization in allergic rhinitis and asthma in contrast to atopic dermatitis. Actually, little is known about the atopic dermatitis patients regarding the allergic sensitization pattern especially in our region.

A recent practice update from American allergy organizations stated that allergen immunotherapy might be considered in selected patients with atopic dermatitis with aeroallergen sensitivity [3].

In this retrospective study, data were collected for the results of skin prick tests for atopic dermatitis patients from a university dermatology clinic in order to study the pattern of allergic sensitization among them.

2. MATERIAL AND METHODS

This was a retrospective study involved the review of medical records of atopic dermatitis cases attending the dermatology clinic in King AbdulAziz University medical clinics between October 2010 and November 2012.

The United Kingdom Working Party criteria were used for the diagnosis of atopic dermatitis [4]. The data collected included the age, gender, presence of other atopic disorder (Allergic rhinitis and asthma) and other medical problems, SCORAD score [5] (if available) and results of skin prick test.

Skin prick testing were done by the investigator according to the standard method [6] using a panel of standardized allergenic extracts. The materials for the test were supplied by the Stallergens company. Histamine dihydrochloride (10 mg/ml or 0.1%) solution was used as a positive control test and a diluent solution of the test extracts was used as a negative control test.

Test area is marked with a pen 1.5 to 2 cm apart on the volar aspect of the forearm and, at least 2 – 3 cm (to avoid false-positive reactions due to direct contamination of a nearby test) from the wrist and the antecubital fossae. A drop of each test solution in addition to the positive and negative control is placed on the skin in identical order for each subject and immediately pricked by single pins (stallerpoints) provided by Stallergens. This does not cause bleeding. Excess test solution from drops on the skin is blotted using a clean tissue making sure that there is no cross-contamination between drops of different allergen extracts. The reading is made 15-20 minutes later. A positive result is recorded with largest wheel diameter of ≥ 3mm.

The project was approved by the local research ethics committee (unit of biomedical ethics-research committee of King Abdul Aziz University, College of Medicine).

3. RESULTS AND DISCUSSION

A total of 63 cases were collected with results of skin prick testing. The study included 39 female patients and 24 male patients. SCORAD ranged from 18.9 to 66.4. The characteristics of patients are presented in Table 1.

Table 1. Characteristics of patients

	Females	Males	Total
Number of cases	41	27	68
Age range	5.5-55 years	7-57 years	5.5-57 years
Mean ±SD	29.76 ±13.8	22.19 ±13.53	26.75±14.1
AD only	16	8	24
Associated AR or AS	25	19	44
No sensitization	6	3	9 (13.24%)
Sensitisation	35	24	59 (86.76%)
Monosensitization	4 (3 to DPt and 1 to cockoroaches)	1 (to Fat hen)	5 (7.35%)
Polysensitization	31	23	54 (79.41%)

AD: Atopic dermatitis, AR: Allergic rhinitis and AS: Asthma. Sensitization depending on the skin prick test results.

Two thirds of patients had other atopic manifestation in the form of allergic rhinitis or asthma or both. The rate of sensitization was 85.7% (54 out of 63). Most of them had been sensitized to more than one allergen (77.8%). Only 9 patients (14.3%) had no sensitization on skin prick testing. Detailed sensitization data is presented in Table 2. Patients with allergic rhinitis and or asthma in addition to atopic dermatitis had higher chance of sensitization than patients with atopic dermatitis only.

Table 2. Detailed sensitization data of patients

	Females	Males	Total
AD only	16	8	24
No sensitization	5	1	6
Sensitisation	11	7	18
Monosensitization	2	0	2
Polysensitization	9	7	16
Associated AR or AS	25	19	44
No sensitization	1	2	3
Sensitisation	24	17	41
Monosensitization	2	1	3
Polysensitization	22	16	38

Detailed sensitization status of eczema patients

Most of the patients were sensitized to mites, Dermatophagoides pteronyssinus and Dermatophagoides farina (80% and 74% respectively). Less commonly they were sensitized to cat fur (24 patients or 44%) and to cockroaches (20 patients or 37%) [See Table 3].

Table 3. Frequency of sensitization to aeroallergens

Aeroallergen	Number of cases	Percentage (of 59)
D Pteronysinus	45	76.27%
D Farinae	43	72.88%
Cat fur	27	45.76%
cockoroch	20	33.9%
Blomia	17	28.81%
fat hen	9	15.25%
4 cereals mix	9	15.25%
alternaria	6	10.17%
bermuda grass	6	10.17%
mugwort	5	8.47%
feathers mix	5	8.47%
rough pigweed	5	8.47%
asperigillus mix	4	6.78%
candida albicans	4	6.78%
yeast mix	4	6.78%
russian thistle	4	6.78%
plantain	3	5.08%
timothy	3	5.08%
rye grass	3	5.08%
penicillin mix	3	5.08%
date palm	3	5.08%
mesquite	2	3.39%
mimosa	2	3.39%
ragweed	2	3.39%
cladosporium	0	0%

Number of cases sensitized to aeroallergens and their percentages in relation to the total sensitized cases

4. DISCUSSION

Aeroallergen sensitization is a manifestation of atopic diseases. Several studies have been published in allergic rhinitis and asthma. Little is known about the pattern of sensitization in eczema patients especially in our region. It is known that the pattern of sensitization differs between countries and different areas of the same region depending on the environmental factors and social habits.

Sensitization to house dust mite was reported to be the most common allergen among allergic rhinitis and asthma [7-9]. Similar results were obtained in our area (Koshak 2006) [10]. Earlier study [11] by GadElRab (1999) showed lower rates of sensitization to house dust mite. This is because of lower prevelance of the antigen in Riyadh area.

Local data from our area for allergic sensitization in allergic rhinitis and asthma patients indicates that the most common allergens were house dust mite followed by cat and cockroaches [12-16].

Different results obtained by some other investigators from Amman clinic (jordan) were the most common allergens in allergic rhinitis were grasses mix, thistle weeds and olive trees followed by cats and mites [16]. In Tikrit (Iraq) the most common senstizers among

asthmatic patients were pollens followed by moulds followed by mites [17]. This can be explained by different geographical and environmental factors. Bener et al. (2002) [18] from UAE SPT results of collection of allergic disorders found that the most common allergens were Mesquite, Grass Mix, Cottonwood, Bermuda Grass, Kochi, Acacia, Alfalfa, Chenopodium, Date palm, Cockroach, house dust and dust mite in descending order.

Additionally, different populations had different sensitization pattern in the same area. There was a difference between the saudi Arabian patients and North American expatriates living in the area regarding the pattern of sensitization [19]. For Saudi Arabian patients the most common allergens were Chenopodium album, Kochia and mesquite whereas expatriates living in the area were sensitized commonly to house dust mite followed by alternaria and grass mix.

Screening for the most common allergic sensitizers showed that house dust mite to be of high prevalence. The most common sensitizers in a cross sectional study in Belgium were house dust mite and grass pollens [20]. Similarly, specific IgE screening among blood donors in Kuwait revealed that, Bermuda grass, house-dust mite (Dermatophagoides pteronyssinus), and Chenopodium album were the most prevalent sensitizing allergens [21].

Aeroallergen sensitization in atopic dermatitis patients in this study was very high (85.7%). This could be due to the fact that most of the patient group had moderate to severe eczema according to the SCORAD index and most of them had another allergic disease in the form of allergic rhinitis or asthma or both. Some studies reported similar high prevalence [2,22]. Lower prevalence was reported by Cheng [23] study in 2012 (45.8% of allergic dermatosis) but this could be due to a collection of clinical entities.

The most common positive results or sensitization were to house dust mite (Dermatophagoides pteronyssinus and Dermatophagoides farina), followed by cat fur antigens then to cockroaches antigen.
Arshad et al. (2001) [24] reported that house dust mite (11.9%), grass pollen (7.8%), and cat (5.8%) were the most common positive reactions among a cohort of children (in Isle of Wight) who were atopic and they showed that the development of eczema was influenced by sensitization to 3 major inhalant (house dust mite, grass pollen, and cat).

House dust mite allergens were found to be the most prevalent sensitizers in atopic dermatitis in a small sample of 34 cases in Hungary [25]. In a larger sample of eczema patients (114) from Bosnia and Herzegovina showed same results [26]. In an even larger studies from Hong kong [2] (816 patients) and Poland [22] similarly, Dermatophagoides pteronyssinus and Dermatophagoides farina (house dust mite allergens) were the most prevalent sensitizers. Patterns of allergic sensitization varies between countries [27,28] but there is agreement about the high prevelance of mite sensitivity among eczema patients.

Blomia tropicalis allergens are distinct and have relatively low to moderate cross-reactivity with Dermatophagoides species [29]. Cat dander is found in most studies around the world as a major source of allergic sensitization [16]. Cat allergy can be a problem even for those who do not keep or own a cat [30].

5. CONCLUSION

In conclusion house dust mite, cats and cockroaches allergens appear to be the most prevalent sensitizers in eczema patients in Jeddah region.

CONSENT

Not applicable.

ETHICAL APPROVAL

The project was approved by the local research ethics committee (unit of biomedical ethics-research committee of King Abdul Aziz University, College of Medicine).

COMPETING INTERESTS

Author has declared that no competing interests exist.

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