

Study of Skin Sensitivity to Various Allergens by Prick Skin Test in Patients with Bronchial Asthma

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Abstract

Objective: The aim of the study is to determine the most common allergens triggering allergic disease in Diyala Governorate.

Materials and Methods: This study including 391 patients (148 male and 243 female) with bronchial asthma attending asthma and allergy unit of Baquba teaching hospital consultation clinic from 4/1/2009 to 31/12/2009. skin prick test were done for them ; the results were fixed according to the reactivity of the allergens used in the study.

Results: Most common offending allergens were house dust mite(25.3%), Bermuda 23% , grasses 19.6% , mugwort 16.6% , fagace 15.8% , chenopoda 15.6% , date palm and batulacea 12.7% , olacea 12% , house dust 11.5% , feather 9.9% , alternaria 9.2% , plantine 8.6% , aspirogillus 6.9% , clodosporium 5.3% , cat hair 4.6% , horse hair 4% , penicillinum 3.3% and dog hair 3%

In the study it was also observed that patients of bronchial asthma had associated allergic rhinitis in 49.1% of cases .

Conclusion: This study and other studies will definitely be helpful in identifying the most common triggering allergens causing various allergic disorders including bronchial asthma in Diyala Governorate ; and this will be helpful in the prevention of asthma and other allergic disorders.

Key words: asthma , allergic rhinitis , prick skin test , allergens.

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Introduction

Aeroallergens play a major role in the pathogenesis of respiratory allergic diseases, particularly asthma and allergic rhinitis. [1- 3].

Epidemiological studies carried out in different countries had reported the prevalence of respiratory allergy from 15% to 30%. [4-6].

Pollens, fungi, animal danders, house dust mites, domestic pets, and insects are of particular importance as triggering factors.

Pollen are well studied as allergens among all other aeroallergens and are important source of pollinosis. Respiratory allergy are prevalent among all populations all over the world. One can really think the gravity of the situation by looking at the epidemiological data available across the globe [1-6].

Knowledge about allergens has progressed rapidly during the last few decades with better understanding of molecular mechanism of allergy. Structure and function of allergens have been identified.[7]

In recent decades a number of authors have argued that allergen exposure is the major primary cause of asthma,[8-11] and the global increases in asthma prevalence could be the result of increases in exposure to aeroallergens because of increased indoor exposure levels¹ or because of increasing amounts of time being spent indoors.[10]

The hypothesised causal mechanism is that allergen exposure produces sensitization and continued exposure leads to clinical asthma through the development of airways responsiveness and inflammation [8]

Allergen skin testing was first used by Dr Charles Blackley to diagnose pollen as the cause of his hay fever in 1873. In 1924 the current skin-prick test (SPT) method was introduced and in 1975 Prof. Jack Pepys proposed the modified skin-prick testing method.[12].

Today the allergen extracts and lancet are standardized and this technique for diagnosing immediate IgE-mediated allergy is used universally.[13]

Allergen skin testing is an extremely safe procedure and only one death as a result of skin-prick testing has ever been recorded.[14,15].

A sssessment of skin reactivity was done according to criteria of positive skin prick test [17,18] .

Materials and Methods

The study was conducted in patients of bronchial asthma attending the Asthma and Allergy Unit of Baquba teaching hospital consultation clinic ; allergy testing was performed during the period from 4/1/ 2009 to 31/12/2009 . Pregnant , lactating females , diabetic, elderly,and children under 4 year old were not included in the study.

For confirmation of the diagnosis clinical examination ,chest x-ray, and pulmonary function testes were performed .

Skin sensitivity testes :-

Antigens were obtained from (stallergen sa France) company, batch number of allergen 83621 and 92386 ; 19 type of allergens and 2 controls.

Before performing skin test, anti histamins ; systemic steroids were stopped but inhaled corticosteroid drugs were continued. Anti histamnes were stopped 10 days before and oral steroids was stopped 3 weeks before performing the skin test .

Only 2+ , 3+ and 4+ reactions were labeled as markedly positive skin reaction. The positive reaction which correlated well with the history were considered as clinically significant reaction [19].

Results

The total number of the patients included in the study were 391 patients , 148 male and 243 female . their ages where between 4 – 63 years (table-1) .

In this study associated allergic disease were also studied, and it was found that bronchial asthma was associated with allergic rhinitis in 49.1% patients. Bronchial asthma was present alone in 50.9% patients as shown in table 2.

Out of 391 patient of bronchial asthma to whom skin prick test was performed 23 patients(5.8%) showed negative reaction to all of the antigens used and 368 patients showed positive reaction .

In this study a total of 7429 skin tests were performed by a total of 19 allergens (dusts , fungi , animal products , pollens , some miscellaneous) for 391 patients of bronchial asthma ; the result of skin reactivity are shown in the table 3.

Most common offending allergens were house dust mite(25.3%), Bermuda 23% , grasses 19.6% , mugwart 16.6% , fagace 15.8% , chenopoda 15.6% , date palm and batulacea 12.7% , olacea 12% , house dust 11.5% , feather 9.9% , alternaria 9.2% , plantine 8.6% , aspirgillus 6.9% , clodosporium 5.3% , cat hair 4.6% , horse

hair 4% , penicillinum 3.3% and dog hair 3%.In the study it was also observed that

patients of bronchial asthma had associated allergic rhinitis in 49.1% of cases .

Table (1): Age distribution of the patients.

Age (years)	Number	Percentage
4 – 13	73	18.67
14 – 23	58	14.83
24 – 33	80	20.46
34 – 43	84	21.48
44 – 53	68	17.39
54 – 63	28	7.16
Total	391	100.0

Table (2): Patients of bronchial asthma and associated allergic disease.

Disease	No of patients	Percentage
Bronchial Asthma only	199	50.9
Bronchial Asthma with allergic rhinitis	192	49.1
Total	391	100.0

Table(3): skin sensitivity to allergens.

No.	Allergen group	Allergens	Number of patient will tre reaction	Percentage
1	Dust	House dust mite	100	25.57
2		House dust	45	11.5
3	Pollens	Bermuda	90	23.01
4		Grasses	77	19.6
5		Mugwarts	65	16.6
6		Fagace	62	15.8
7		Chenopda	61	15.6
8		Butalacea	50	12.7
9		Date palm	50	12.7
10		Oleacea	48	12.2
11		Plantin	34	8.6
12	Fungi	Alternaria	36	9.2
13		Aspirgillus	27	6.9
14		Clodosporium	21	5.3
15		Pencillinum	13	3.3
16	Animal products	Feather	39	9.9
17		Cat hair	18	4.6
18		Horse hair	16	4.09
19		Dog hair	12	3.6

Discussion

In patients of bronchial asthma, markedly positive skin reaction (2+ to 4+) were quite common for the various allergen test. The common offending allergens found in the study were dusts, pollens, fungi, and animal products.

In the first group (dusts) the markedly positive skin reaction to dusts antigens varies from 11.3% to 25.27% (average 18.38%) in patients with bronchial asthma.

This group were found the highest group among the allergens used in the study causing allergic reaction to the patients; this means that these (dusts) allergens are the common allergens in the area of study Diyala governorate.

The second group of markedly positive skin reactions were the pollens. Reaction to pollen antigens varied from 8.6% to 23.01% (average 21.7%); first one (of the highest reactivity) in the group was Bermuda grass.

The third group according to their reactivity were the fungi; reaction to fungi antigens varied from 3.3% to 9.2% (average 6.17%), the first one which is highly reacting in this group was *Alternaria*.

The last group in allergic reaction in this study were the animal products; reaction to animal products antigens varied from 3.06% to 9.9% (average 5.41%); the first antigen of markedly positive reaction in this group was feather. Table 3.

Many studies were conducted in Iraq showed variable results. Study conducted by Ameera AL-Naimi [20] showed more or less similar incidence of markedly positive skin reaction; in this study the house dust mite was of the highest markedly positive reactivity antigen.

Lin *et al.* [16] investigated 10 400 standardised allergen SPTs and found that no adverse reactions were reported. In the largest study of skin-prick testing reactions ever recorded (over 18 000 patients on whom

497 656 individual skin tests to various allergens were performed), only 5 mild systemic reactions were recorded.[15]. These all responded promptly to antihistamine medication within 1 hour. [13].

In other studies conducted in Iraq by AL-Niami [21], AL-Tae [22] showed also more or less similar results in which the house dust mite was the first markedly positive antigen while another study conducted by Dakhllalla [13] the results were different that house dust mite was not the markedly positive antigen. [23]

Conclusion

The present study and other studies will definitely be helpful in identifying the allergens causing various allergic disorder including bronchial asthma in the governorate. Further more this study may also be helpful in controlling or avoiding allergens causing allergic disease.

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