

Evaluation of Skin Prick Test for Common Aeroallergens in Patients Presented with Bronchial Asthma in Tikrit Teaching Hospital

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Abstract

The prevalence of allergic diseases such as asthma is high in general population and aeroallergens are the most common allergens that cause air way inflammation.

The aim of this study is to identification of the most common aeroallergens by skin prick tests and the risk factors among asthmatic patients.

A retrospective study were conducted on 130 patients with Bronchial asthma of these patients 68(52 %) were male and 62 (48%) were female . Age of patients was between 7 to 75 years with a mean of age: 31.62 yr.

The patients were referred to allergic clinic of Tikrit Teaching Hospital and skin prick tests(SPT) response to aeroallergens were studied which shows 115(88%) of patients were sensitized , but 15(12 %) had negative SPT (unsensitized), among the sensitized patients 17(13 %) were monosensitized against one allergen, 39 (30%) were sensitized against 2 allergens and 59(45%) sensitized against 3 allergens.

In regard to pollen aeroallergens(61%) were considered the most common allergen and among pollen the bermuda (36%) had the highest rate of sensitization. Also this study shows the prevalence of Asthma was higher in a third decade age group while less in sixth decade and according to the occupation, positive SPT were higher in house wives patient(38%).

From this study, it can be concluded that pollens are the main sensitizing aeroallergens among patients with asthma presented at Tikrit Teaching Hospital.

Introduction

Asthma are the most common allergic disorders in Iraq and other countries. The incidence of these allergies has been increasing worldwide over the recent years (1). Asthma is a major cause of chronic morbidity and mortality throughout the world that is characterized by paroxysmal spasmodic narrowing of the bronchial airway due to inflammation of the bronchial tree and bronchial smooth muscle contraction (2) . Asthmatic airways are characterized by an immunologic chronic inflammation that has been documented to occur after exposure to an allergen.(3,4) Several studies have suggested a correlation between allergen exposure and the prevalence of asthma(5-7) In sensitized individuals, exposure to airborne allergens is a risk factor for asthma exacerbations, the persistence of asthma symptoms, and significant changes in pulmonary function.(8-10) Indoor allergens today have increased in developed countries where homes

have been carpeted, heated, cooled and humidified, changes that made homes an ideal habitat for the generators of indoor allergens. (11,12) Allergic disorders are diagnosed by a proper history, physical examination and some paraclinical findings, Serum total IgE, eosinophylic count, specific IgE, skin prick test, RAST test and respiratory function test. (13) Skin prick testing is the simple and available tools for evaluation of allergic patients and determination of the diseases frequency in communities.[12]

The aim of this study is identification of the most common aeroallergen by SPT and the risk factors for allergy such as occupation, ages and family history of atopy in order to develop better strategies for management and prevention of asthma.

Patients and methods

This a retrospective study was carried out from September 2008 to May 2010 including

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130 patients with bronchial asthma who had presented to allergic clinic of Tikrit Teaching Hospital in sallah Al-deen governorate.

Information of patients was taken from chart which included data about sex, age, occupation, family history of atopy and types of exposed allergens.

SPTs were performed to the patients with bronchial asthma by using a panel of standardized allergenic extracts including 18 aeroallergens such as Pollens[grasses , bermuda, plantain, tree I, tree II, tree III, chenopodium , mugwort], Moulds as; [mould I (alternaria), mould II cladosporium, mould III (penicillium), mould IV (aspergillus), candida], Mites as; [Dermatophagoides pteronyssinus(DP) and Dermatophagoides farina(DF)], other inhalants such as (mosquito , feather and wool). SPTs were done by allergist. The allergenic extracts as well as Glycerol buffer and histamine (negative and positive controls respectively) were placed on to the volar surface of forearm and introduced into the epidermis by a disposable hypodermic needle , skin reactions which measured 15-20 minutes after the pricks and the positivity was defined as a mean wheal diameter of at least 3 mm and compared with positive and negative control reactions .All data were analyzed on statistical program (SPSS, version 10).

Results

Out of 130 patients with bronchial asthma, 68(52%) were male and 62(48%) were female. The age of patients was between 7 to 75 years with a mean of age: 31.62 yr.

The study results had shown that 15 (12%) of the patients had negative SPT while 115 (88 %) of the patients had positive response (sensitized) to at least one allergen and poly sensitizations was common which being sensitized to more than one allergen. In particular, 17(13%) of patients were sensitized against one allergen, 39(30%) against 2 allergens and 59(45%) were sensitized for 3 allergenic extracts as shown in table (1).

This study report the prevalence rates of main allergen groups of the total positive allergens were Pollens:139 (61%),

Moulds:38(17%), Mite32(14%), Other allergens:18(8%). In addition, frequency of positive tests to individual allergen of the total positive cases is depicted in table 2 which shows high prevalence of skin reactivity to Pollens: Bermuda41(36%), Grass32(28%) ; Moulds: Mould I 39(34%), Mould II 20(17%) while skin reactivity were low to other allergens: Mosquito11 (9.5%) , Feather7(6%) and Wool 0(0%).

Figure (1) Shows Prevalence of Bronchial asthma in patients with positive SPT was higher in age group (20-29) while less in age group (50-59).

Regarding prevalence of bronchial asthma according the occupation the result shows that house wives patients 49 (38%) more affected as shown in figure (2)

Discussion

Aeroallergens are the prominent causes of allergic symptoms in patients with asthma and its finding that the most prevalent allergen had been the subject of many studies throughout the world, but studies in different parts of the world could not show a unique pattern of sensitization. In this study (88%) of patients were sensitive to aeroallergen but (12%) had negative SPT in spite of classic clinical findings of asthma , this agree with the study in Iran were report(92%)(15) of patients had positive skin reaction to aeroallergens ,in addition other two studies in Iran which report (97.1 %)(16) ,(63.2%)(17) of patients had Positive SPT, as well study in Saudi Arabia record (74.8%)(18) .

In other hand this study demonstrate (13%) of the sensitized patients were monosensitized against one allergen and others were poly sensitized to more than one allergen, where (30%) sensitized to 2 allergen and (45%) sensitized against 3 allergens, this agree with study in Saudi Arabia(18) which reports (17%) of patients were monosensitized, (39%) sensitized against 2 allergens and (40%) had sensitization against 3 allergens, while study in Iran reports that (88%) of patients were monosensitized , (3%) sensitized against 2 allergens and (2%) sensitized against 3 allergens (15)

Regarding to the most frequent aeroallergen detected by the SPT was Pollen (65%) this agree with a study in Portugal where Pollens had the highest sensitivities (76.2%) (19) , this high frequency of sensitivities to pollens may related to great varieties of plants in our region .also study in Kuwait, found pollens sensitivities (87.1%)(20) as the major allergens.

Whereas a study in United Arab Emirates had revealed mosquito allergens as the most common aeroallergen (21), because the dry and hot climate these results were expected.

The present study result had shown that among pollens the Bermuda (36%), had the highest rate of sensitization while korea (22) , Iran(17) and Saudi Arabia(23) studies revealed the highest degree of sensitization to weeds pollen while in southwest Germany, grass pollens were found to be the major allergens (24) and in Kuwait the most prevalent sensitizing pollens were from chenopodium (70.7%) (19).

Concerning moulds(17 %) the study recorded it as the second important sources of allergens while Turkey studies (25) report (9%) of patients were sensitized to mould . Most allergenic moulds can grow on nonliving organic matter, while a few require a living host. Both groups need moisture, oxygen, preformed carbohydrate and occasionally additional growth factors .Many familiar moulds grow actively at 20 °C and may flourish well above or below this temperature ;others require low temperature, proliferating even under refrigeration.

Although fungal components may be ingested allergens, inhaled spores are the major source of exposure. Sensitivity to inhaled mould allergens is prominent factor in asthma. The most allergic moulds are *Alternaria*, *Aspergillus*, *Cladosporium* and *penicillium*(26). Among moulds this study showed 30% of patients were sensitized to mould I (*alternaria*) while other study report (91%) (27).

As well as this study report the mites as a third in percent frequency(14%) , while other studies report house dust mite as the highest rate of sensitization among saudi Arabia asthmatic patients(18) .

In addition, house dust mite was reported to have the highest rate of sensitization among

patients with asthma in Hong Kong, Chicago (28) , United Kingdom (29), Istanbul(30), Thailand (31) and Malaysia (32).

This was expected since mite tends to require high humidity and moderate temperature to thrive and this important cause of sensitization in asthmatic children(33,34) , in contrast, our region had a dry climate.

This study result had shown that sensitivity to animal dander (feather, wool) was found as(6%),(0 %) respectively while turkey study(24) report was(16%) where as in Western and European countries(35) there is high incidence of domestic pets in their homes than our country so sensitivity to animal dander is found to be higher in those countries . In regard to (Barbee RA etl) study(36) of Korean patients which report high skin reactivity in the third decade age group and less in the sixth decade, Also This study which report the highest prevalence of bronchial asthma in a third decade age group and less in the sixth decade age group . It's thought that the decrease of skin reactivity by age is may be due to a decrease in a total serum IgE as well as a decrease in reactivity to histamine(37). concerning the occupation is considered one of the risk factors of bronchial asthma in which This study recorded the highest prevalence of skin test reactivity among house wives patient (38%), the high percent frequencies of sensitization in these patients , may be because females spend most their time in the house and exposed more to the indoor allergens such as (mite, mould) that are found throughout the house, including beds, furniture and carpets, although the highest levels are typically found in the kitchen(38),but exposure in the bedroom and family room may be more relevant in causing the sensitization(24) . Also in Worldwide reports had shown that there is evidence to suggest that house dust mites are the most common indoor allergens associated with asthma.(39)

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Table (1) Frequency & severity of SPT response of the asthmatic patients.

Prick test response	Bronchial asthma	Total no(%)
Negative	15	(12%)
Positive to one allergen	17	(13%)
2+	39	(30%)
3+	59	(45%)
Total	130	(100)

Table (2) Frequency of positive SPT to the individual allergens among patients with asthma.

Allergen	Number of subjects with positive SPT	% frequency of all positive cases
Pollens:		
Bermuda	41	36%
Grass	32	28%
Platain	18	16%
Chenopodium	18	16%
Tree I	14	11%
Tree II	12	10%
Tree III	7	6%
Mugwart	7	6%
Moulds:		
Mould I	39	34%
Mould II	20	17%
Mould III	12	10%
Mould IV	12	10%
Candida	0	0%
Mites:		
D . pteronyssinus	21	18%
D. farina	11	9.5%
Other allergens:		
mosquito	11	9.5%
Feather	7	6%
Wool	0	0%

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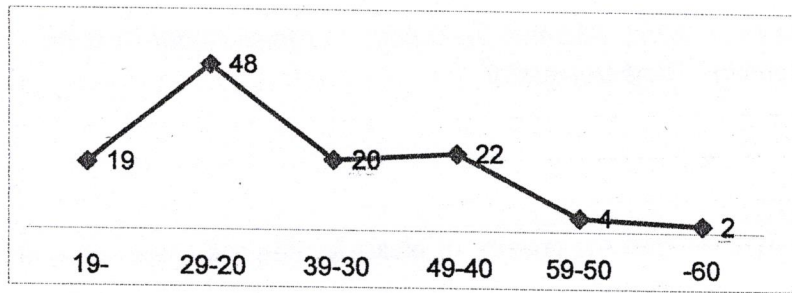


Figure (1) Shows prevalence of positive SPT in patients with asthma according the age group.

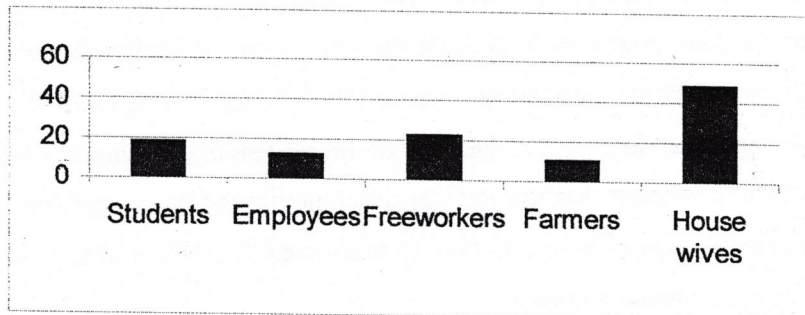


Figure (2) Shows prevalence of positive SPT in patients with asthma according the occupation.