

A study of Skin prick test reactivity to common aeroallergens among patients with allergic rhinitis in Salahelden Governorate

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Abstract

Background: Allergic rhinitis is an extremely common disease worldwide. Aeroallergens are very often involved in allergic rhinitis and their prevalence pattern of sensitization vary between different countries and populations.

Aim: The purpose of this study was to demonstrate the prevalence of skin reactivity to different aeroallergens in patients with allergic rhinitis in Sallahellden Governorate.

Patients and Methods : A retrospective study were conducted on 62 patients with allergic rhinitis, of these patients 37(60 %) were male and 25 (40%) were female . Age of patients was between 6 to 68 years with a mean of age: 34.52 yr.

Results : The patients referred to allergic clinic of Tikrit Teaching Hospital and skin prick test(SPT) response to aeroallergens were studied which shows 59(95%) of patients had positive SPT but 3(5 %) were unsensitized .

Among the sensitized patients 8(13 %) were monosensitized against one allergen, 51 (82%) were polysensitized for more than one allergen .

In regard to frequencies of Pollen (65%), Mould(28%) were considered the most common aeroallergens, among pollen the grass aeroallergen (61%) which had the highest rate of sensitization. In addition the study found higher positive SPT frequencies in house wives patient(41%) .

Conclusions: It was concluded that the pollens, moulds are the major aeroallergens provoking allergic rhinitis in Sallahellden Governorate. with high sensitization frequencies in house wives patient .

Introduction

Allergic rhinitis are the most common allergic conditions in Iraq and other countries. The incidence of these allergies has been increasing worldwide over the recent years ^[1].

Allergic rhinitis is an inflammatory condition of the nasal mucosa characterized by nasal symptoms including sneezing, runny nose, itching and nasal congestion, induced by an IgE - mediated response (type I hypersensitivity).^[2] Aeroallergen with an origin from plants (pollen) , moulds and mites are the most common allergens involved in allergic rhinitis^[3]. However, identification of the full spectrum as well as the most common aeroallergen to which the patient responds in each area still has a very important role in diagnosis and treatment of allergic rhinitis. Choosing the most reliable and the most cost effective panel of allergen extracts for skin prick test (SPT) as the most appropriate diagnostic test. Avoiding allergen exposure is the first step in the management of allergic rhinitis, although it is not straightforward and finding the best formulation of inhalant allergen immunotherapy as an effective treatment, strictly depend on information about the most important aeroallergens in each area. Many studies have shown that the distribution and pattern of aeroallergens is significantly different in different countries⁽⁴⁾ and even in different parts of a country^[5] . 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^[6,7].

The aim of this study was to identification the prevalence of skin reactivity

to different aeroallergens in patients with allergic rhinitis in Sallahellden .

Patients And Methods

A retrospective study was designed include 62 patients with allergic rhinitis who presented to allergic clinic of Tikrit Teaching Hospital between September 2008 and November 2009 .

A questionnaire of patients was reviewed which included data about sex, age, occupation, family history of atopy and types of allergens

Skin prick testing are the simple and available tools for evaluation of allergic patients and determination of the diseases frequency in communities.⁽⁸⁾ All patients underwent skin prick test (SPT) with at least 18 allergenic extracts including extracts of Pollens such as [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)] and other inhalants such as (mosquito ,feather and wool). SPTs were done by allergist, Glycerol buffer and histamine were included as negative and positive controls, respectively. The allergenic extract and positive-negative controls were applied to volar surface of arm then introduced into the epidermis by a disposable hypodermic needle. Skin reactions were evaluated according to the diameter of edema and erythema were compared with positive and negative control reactions after 15-20 minutes. All data were analyzed on statistical program (SPSS, version 10).

Results

Among 62 patients with allergic rhinitis, 37(60 %) were male and 25(40%) were female. the age of patients was between 6 to 68 years with a mean of age: 34.52 yr. Positive family history of atopy was seen in(39%) of patients.

Three(5%) of the patients had negative SPT while 59 (95%) of the patients had positive response (sensitized) to at least one allergen and the poly sensitizations was common which being sensitized to more than one allergen .In particular 8(13%) of patients were monosensitized against one allergen, 51(82%) were poly sensitized as shown in table(1)

Table(1) Frequency & Severity of SPT Response of The Patients.

Prick test response	Bronchial asthma	Total no(%)
Negative	3	(5%)
Mono-sensitization	8	(13%)
Poly-sensitization	51	(82%)
Total	62	(100)

The study report the prevalence rates of main allergen groups of the total positive allergens reaction were Pollens:99(65 %) , Moulds:42(28 %), Mite:5(2%), other allergen7(5%) . In addition ,frequency of positive tests to individual allergen of the total positive cases is depicted in table 2 which

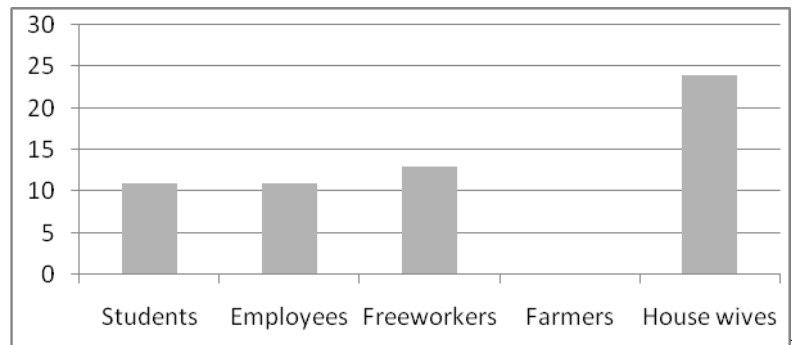
shows high prevalence of skin reactivity to Pollens: Grass36(61%) Bermuda26(44%), and Moulds: Mould I 14(24%), Mould II 21(20%) while skin reactivity were low to Other allergens: Mosquito11(9.5%), Feather7(6%) and Wool 0(0%).

Table(2) Frequency of Positive SPT to The Individual Allergens Among Patients with Allergic Rhinitis.

Allergen	Number of subjects with positive SPT	% frequency of all positive cases
Pollens:		
Bermuda	41	
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%

According to the occupation of patients with allergic rhinitis, house wives patient (41%) had the highest

percent frequency as shown in figure(1)



Figure(1) Shows Prevalence of Positive SPT in Patients with Allergic Rhinitis According the Occupation.

Discussion

Aeroallergens are the prominent causes of allergic symptoms in patients with allergic disease and its finding that the most prevalent allergen has 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 (95%) of the patients were sensitive to aeroallergen but (5%) had negative SPT, this negative reaction maybe probably that the patients were sensitized to particular allergens which have not been tested in our study; or not identified yet; or some non-allergic forms of rhinitis included among our cases. This high percent of sensitization also were shown by the two studies in Iran which report(81%)^[9], (92%)^[10] of their patients had positive skin reactivity to aeroallergens .

In other hand our study demonstrate (13%) of the patients were monosensitized against one allergen and others (82%)were poly sensitized to more than one allergen , Iranian study had shown that over 90 % of the allergic rhinitis patients were poly-sensitized while study in Poland^[11], report that 85 % of the patients had hypersensitivity to more than one allergens, also other study record 65 % of the sensitized subjects were poly sensitized ^[12].

The cause of poly-sensitization toward several allergens might be because of various factors such as genetic and environmental factors which favour growth and vegetation of specific plant species that cause allergic reactions^[13]

This study had been shown that pollens(65%) constitute the major sensitizing aeroallergen in patients with allergic rhinitis in Salahelden Governorate, this agree with a study in Iran ^[9] and studies in most European and North American countries^[14]which shows pollens allergens as the highest sensitization rates among patients with nasal symptoms, the interpretation of higher frequency of sensitivities to pollens may related to great varieties of plants in our region, also there is many studies have shown that temperature, precipitation, relative humidity and atmospheric CO2 influence pollen production and concentration in the atmosphere and consequently increase exposure to pollen, although

there is a body of evidence suggesting racial differences important in sensitization of patients to specific allergens ^[15,16].

Among pollens grass had the highest rate of sensitization(Table 2).Also in Ankara, grass pollens were found to be the major allergens comparing to Tehran ^[17]and Seoul^[18] studies which record weeds as the major pollen allergen.

Whereas Ragweed pollen is considered as a major provocative factor for rhinitis in North America ^[19] while Chenopodium allergen in Kuwait(a desert environment), had the higher sensitization rates among pollens which belong to plants that were imported for shade or for binding sand ^[20]. Herbal geography, climate and temperature is responsible for these variations.

Concerning moulds(28%) (fungal components) our study recorded it as the second important sources of allergens, according to (All India Coordinated Project on Aeroallergens and Human Health) the report that, major allergens vary from place to place in India and the major causative agents implicated are pollen , fungal spores and dust mites^[21]. This consequence of sensitization of main allergens groups was reported in our study.

As well study in Iran^[9] report mould as a second in frequency. 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 ingestant allergens, inhaled spores are the major source of exposure.

As well as our study report the mites as a third in percent frequency(2%), the explanation for low rate of sensitization despite the absence of apparent mite infestation could be previous exposure in another place or a cross-reaction between mites and cockroach, due to presence of tropomyosin as a major antigen in both species^[22].

In contrast, house dust mites were reported to have the highest rate of sensitization among patients with allergic rhinitis in Thailand,^[23] Singapor^[24] and Mexico City^[25].

This difference also was expected since mites tend to require high humidity and moderate temperature to thrive, whereas salaheldeen has a dry climate and the temperature in summer is high .

Surprisingly, mite allergens were also reported in hot and dry regions, like Kuwait ^[12] and Sistan and Baluchestan Province of Iran ^[26]. It might be related as reported that the wide use of air conditioners which make good conditions for mites to grow and increase susceptibility to indoor allergens^[9].

Our study result had shown that there is no any sensitivity to animal dander, in contrast Western and European countries^[26] shows higher percent of sensitization because the incidence of domestic pets in their homes more than our country .

About the occupation is considered one of the risk factors of bronchial asthma where this study record

References

1. Worldwide variations in the prevalence of asthma symptoms: the International Study of Asthma and Allergies in Childhood (ISAAC) Eur Respir J 1998; 12 (2): 315- 35.
2. American Thoracic Society. Progress of the interface of inflammation and asthma. Am J Respir Crit Care Med 1995;152:385-9.
3. Sibbald B, Rink E. Epidemiology of seasonal and perennial rhinitis: clinical presentation and medical history. Thorax. 1991;46 (12):895-901.
4. Bousquet PJ, Chinn S, Janson C, Kogevinas M, Burney P, Jarvis D. Geographical variation in the prevalence of positive skin tests to environmental aeroallergens in the European Community Respiratory Health Survey I. Allergy. 2007;62(3): 301 -9.
5. Arnedo-Pena A, García-Marcos L, García Hernández G, Aguinagua Ontoso I, González Diaz C, Morales Suárez-Varela M, et al. Time trends and geographical variations in the prevalence of symptoms of allergic rhinitis in 6-7-year-old children from eight areas of Spain according to the ISAAC. An Pediatr (Barc). 2006;62(3):229-36.
6. Robinson D. Allergen-induced airways inflammation in asthma. Monaldi Arch Chest Dis. 1996;51:469-74.
7. Sporik R, Holgate ST, Platts-Mills TA, Cogswell JJ. Exposure to house-dust mite allergen (Der p1) and the development of asthma in childhood. A prospective study. N Engl J Med. 1990;323:502-7.
8. Stazi MA, Sampogna F, Montagano G, Grandolfo ME, Couilliot MF, Annesi-Maesano I. Early life factors related to clinical manifestations of atopic disease but not to skin-prick test positivity in young children. Pediatr Allergy Immunol. 2002; 13 (2): 105- 12.
9. Mohammad Fereidounia, Reza Farid Hossinia, Farahzad Jabbari Azada, Mohammad Ali

the highest prevalence of skin test reactivity among house wives patient (41%), 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^[28] .

Concerning the genetic factor which represented by a family history of atopy is an established risk factor for the development of allergic rhinitis in most studies^[16] where (39%) of the our patients had positive family history of atopy. where as Positive family history of atopy was seen in (60%) of patients in Iran ^[9].

In conclusion pollens, moulds are the major aeroallergens provoking allergic rhinitis in Salahellden Governorate. The results suggest the use of these allergens in any diagnostic or treatment strategy for the management of allergic rhinitis patients.

Assarezadegana,b and Abdolreza Varasteh Skin prick test reactivity to common aeroallergens among allergic rhinitis patients in Iran, Allergol et Immunopathol. 2009;37(2):73-9

10. Fatemeh Behmanesh, Mohamad Shoja, Mohammad Khajedaluae, Macedonian Prevalence of Aeroallergens in Childhood Asthma in Mashhad .Journal of Medical Sciences. 2010 Jun 15; 3(2):3-4.
11. Gniazdowska B, Doroszewska G, Doroszewski W. Hypersensitivity to weed pollen allergens in the region of Bygdoszcz. Pneumonol Alergol Pol. 1993;61(7-8):367-72.
12. Ezeamuzie CI, Thomson MS, Al-Ali S, Dowaisan A, Khan M, Hijazi Z. Asthma in the desert: spectrum of the sensitizing aeroallergens. Allergy. 2000;55(2): 157-62.
13. Foucard T. Allergy and allergy-like symptoms in 1,050 medical students. Allergy. 1991;46(1):20-6.
14. Solomon WR, Platts-Mills TAE. Aerobiology and inhalant allergens. In: Middleton E, Reed ChE, Ellis EF, Adkinson NF, editors. Allergy Principles and Practice. USA: Mosby, 1998: 367-403.
15. Celedon JC, Sredl D, Weiss ST, Pisarski M, Wakefi eld D, Cloutier M. Ethnicity and skin test reactivity to aeroallergens among asthmatic children in Connecticut. Chest. 2004;125(1):85-92.
16. Joseph CL, Peterson EL, Johnson CC, Ownby DR. Racial differences in allergen sensitivity. Chest. 2004;126(3):1004-5.
17. Movahedi M, Moin M, Farhoudi A. A comparison between diagnostic clinical tests and herbal geography in allergic patients in Tehran and Karaj cities. Iranian Journal of Allergy, Asthma and Immunology 2000; 1(1): 29-31. NF, editors. Allergy Principles and Practice. USA: Mosby, 1998: 367-403.
18. Sener O, Kim YK, Ceylan S, Ozanguc N, Yoo TJ. Comparison of skin tests to aeroallergens in Ankara

- and Seoul. J Investig Clin Immunol. 2003;13(3): 202-8.
19. Solomon WR, Platts-Mills TAE. Aerobiology and inhalant allergens. In: Middleton E, Reed ChE, Ellis EF, Adkinson NF, editors. Allergy Principles and Practice. USA: Mosby, 1998: 367-403.
20. Dowaisan A, Al-Ali S, Khan M, Hijazi Z, Thomson MS, Ezeamuzie CI. Sensitization to aeroallergens among patients with allergic rhinitis in a desert environment. Ann Allergy Asthma Immunol. 2000; 84(4): 433-8.
21. Singh AB, Kumar P. Aeroallergens in clinical practice of allergy in India. An overview. Ann Agric Environ Med. 2003;10(2): 131-6.
22. Flores I, Mora C, Rivera E, Donnelly R, Montealegre F. Cloning and molecular characterization of a cDNA from *Blomia tropicalis* homologous to dust mite group 3 allergens (trypsin-like proteases). Int Arch Allergy Immunol. 2003;130(1):12-6.
23. Pumhirum P, Towiwat P, Mahakit P. Aeroallergen sensitivity of Thai patients with allergic rhinitis. Asian Pac J Allergy Immunol 1997; 15(4): 183-5.
24. Chew FT, Lim SH, Goh DY, Lee BW. Sensitization to local dust- mite fauna in Singapore. Allergy. 1999; 54(11): 1150-9.
25. Ontiveros CR, Lopez SM, Cerino JR. Aeroallergens detected by skin prick test in children with respiratory allergy (asthma and rhinitis); from the south of Mexico City. Alergia Immunol Pediatr. 1995; 4: 112-116.
26. Khazaei HA, Hashemi SR, Aghamohammadi A, Farhoudi F, Rezaei N. The study of type 1 allergy prevalence among people of South-East of Iran by skin prick test using common allergens. Iran J Allergy Asthma Immunol. 2003;2(3):165-8.
27. Charpin D, Veruloet D, Lanteaume A, Kleisbauer JP, et al. Respiratory allergy and domestic animals. Survey in a sample of the general population. Rev Mal Respir. 1989;6(4):325-328.
28. Tezcan, N. Uzuner, C. Sule Turgut, Ö. Karaman and S. Köse. Retrospective evaluation of epidermal skin prick tests in patients living in Aegean region. Turkey Allergol et Immunopathol. 2003;31 (4): 226-30.

دراسة لوخز الإبر التفاعلي لأكثر مسببات الحساسية الهوائية في وسط المرضى المصابين بالحساسية الأنفية في محافظة صلاح الدين

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الملخص

التهاب الأنف التحسسي هو مرض شائع جدا في جميع أنحاء العالم. مسببات الحساسية الهوائية كثيرا ما تشارك في حساسية الأنف ونمط انتشارها متفاوت بين مختلف البلدان والسكان.

والغرض من هذه الدراسة لإثبات مدى انتشار تفاعل الجلد للمواد المسببة للحساسية في المرضى الذين يعانون من حساسية الأنف في محافظة صلاح الدين.

أجريت دراسة استيعابية على 62 من المرضى الذين يعانون من حساسية الأنف، 37 (60%) من هؤلاء المرضى من الذكور و 25 (40%) من الإناث. وكان عمر المرضى ما بين 6 إلى 68 سنة مع متوسط العمر: 34,52 سنة.

وقد تم دراسة المرضى المحولين إلى عيادة الحساسية في مستشفى تكريت التعليمي من خلال وخز الجلد لاختبار مسببات الحساسية الهوائية والتي بينت 59 (95%) من المرضى لديهم نتيجة توعية ايجابية للوخز و لكنها بينت 3 (5%) من المرضى كانت لديهم نتيجة توعية سلبية لتلك المواد.

وكان من بين المرضى المصابين بالتوعية 8 (13%) لديهم توعية أحادية monosensitized ضد أحد مسببات الحساسية وكان 59 (82%) من المرضى لديهم توعية متعددة polysensitized لأكثر من مسبب في ما يتعلق حول نسبة ترددات حبوب طلع النبات pollen (65%) والعفن (28%) تعتبر من أكثر المواد المسببة للتوعية شيوعا، من بين حبوب الطلع كان العشب grass (61%) لديه أعلى معدل للتوعية. بالإضافة إلى ذلك وجدت الدراسة نسبة أعلى من التوعية الإيجابية للوخز عند مرضى ربات البيوت (41%). وخلصت هذه الدراسة إلى أن الطلع والعفن هي المواد الرئيسية المثيرة للحساسية الأنفية في محافظة صلاح الدين.