

Prevalence of Aeroallergens in Patients with Symptoms of Respiratory Allergy in Al-Najaf Province.

انتشار المحسسات الاستنشاقية بين مرضى الحساسية التنفسية في محافظة النجف.

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Abstract

Back ground: Identification of the most common aeroallergens to which patients are sensitized in a specific area is important in the diagnosis and treatment of respiratory allergy,

Aim:the aim of this study is to investigate the pattern of skin prick test reactivity to various aeroallergens among allergic patients by skin prick test and the associated risk in Al-Najaf city.

Methods: a cross section study were conducted on 128 patients (67 male and 61 female) with respiratory allergies, age of patients range from 15-63 years with mean of 35.48 ± 10.521 . Skin Prick Tests (SPT) were done for them with series of common allergenic extracts.

Results: skin prick test was positive in (87.5%) of patients. Skin prick tests results showed high percent of sensitization to tree pollens especially date palm pollens (48.2%) followed by Bermuda grass pollens (31%) ,HDM genus glycyfygus was the more prevalent in patients suffer from mite sensitivity, whereas alternaria mold was the most prevalent type of molds. The study showed that young age group exhibit skin test reactivity more than other age groups($p < 0.05$) and housewives and employers had high percent of skin positivity, additionally , skin test reactivity was significantly higher in people live in urban area than those live in rural area.

Conclusion: pollens were the most common aeroallergens in patients with allergic symptoms.

الخلاصة:

خلفية البحث: يعتبر تحديد أكثر المحسسات شيوعاً من تلك التي يتحسس لها المرضى في مناطق معينة أمراً مهماً في تشخيص الحساسية التنفسية ومعالجتها.

الهدف: تهدف هذه الدراسة المستعرضة الى بحث نمط تفاعلية اختبار الوخز الجلدي لمختلف المحسسات لدى المرضى الذين يعانون من الحساسية في محافظة النجف.

المنهجية: أجريت هذه الدراسة المستعرضة على 128 مريض من مرضى الحساسية التنفسية. وتتراوح اعمارهم بين 15-63 سنة وقد تم إجراء اختبار الوخز الجلدي لهم بمجموعة من مستخلصات المحسسات الشائعة .

النتائج: اختبار الجلد الوخزي كان موجبا لدى 87,5 % من المرضى و اظهرت نتائج فحص الجلد بأن التحسس للقاح الاشجار شكّل النسبة الاكبر و بصورة خاصة لقاح طلع النخيل 48,2 % ، يليه التحسس للقاح الثيل الامريكي 31 % . و كانت حُلم غبار المنزل من نوع Genus glycyfygus هي الاكثر شيوعا لدى المرضى الذين يعانون من حساسية اللحم (Mites) ، بينما كان فطر Allernaria هو الاكثر انتشارا لدى مرضى التحسس من الفطريات. كما ولوحظ أن الفئات العمرية الشابة اظهرت تفاعلية ايجابية لاختبار الجلد اكثر من الفئات الاكبر عمرا و بفارق معنوي $P < 0.05$ ، و كذلك ان ربوات البيوت و الموظفين يشكلون نسبة عالية من المرضى ذوي التحسس ، و ان المرضى الذين يسكنون في المدينة لديهم تفاعلية لوخز الجلد اكثر من الذين يسكنون في الريف و بفارق معنوي $P < 0.05$.

الاستنتاج: خلصت هذه الدراسة أن محسس اللقاح هو الاكثر شيوعا لدي المرضى في النجف.

INTRODUCTION

Respiratory allergy (allergic rhino conjunctivitis and allergic asthma) is a common allergy among all populations throughout the world and by reviewing epidemiological studies obtained from different countries, one could get a clue on the importance of this health issue .The prevalence of allergic diseases is rising dramatically in both developed and developing countries ranging from 15-30% all over the world (1).

Aeroallergens (air born allergens) play key role in triggering and pathogenesis of respiratory allergic diseases. Dust mites, pollens, molds and animal dandruff are the most important allergens implicated in initiating allergic reactions, however, the distribution of different aeroallergens is widely different from one country to another (2).

Skin tests represent the easiest tool to obtain quick and reliable information for the diagnosis of allergic respiratory; they can identify sensitivity to inhalant allergens and according to the test result allergen avoidance or desensitization will improve symptoms (3).

To obtain reliable clinical results, the test should be performed by a health professional. An allergist should be present to select the allergens, interpret the results and deal with any anaphylactic reaction that might rarely occur (4).

Antihistamine tablets/syrups or medications with antihistamine-like actions (such as some cold remedies and antidepressants) should not be taken for 3-7 days before testing as these will interfere with the results of the test (5).

PATIENTS AND METHODS

The study was carried out from March 2013 to February 2015 including 128 patients with bronchial asthma and/or allergic rhinitis who attend Asthma and Allergy Centre in Al-Sadder Medical City in AL-Najaf province, their age range from 15-63 years with mean of 35.48 ± 10.521 . all patients carefully examined by respiratory & ENT specialists and they were off treatment by antihistamines and systemic oral steroids for at least one week before testing. Information of patients regarding ,age, sex, occupation, residency, family history of similar or other allergic conditions, history of other disease, smoking , drug history were taken.

Skin prick test(SPT) performed to the patients by using a panel of standardized allergenic extracts including: Pollens[five grasses , bermuda, plantain, tree I, tree II,tree III, chenopodium , mugwort], Moulds as:[mould I (alternaria),mould II

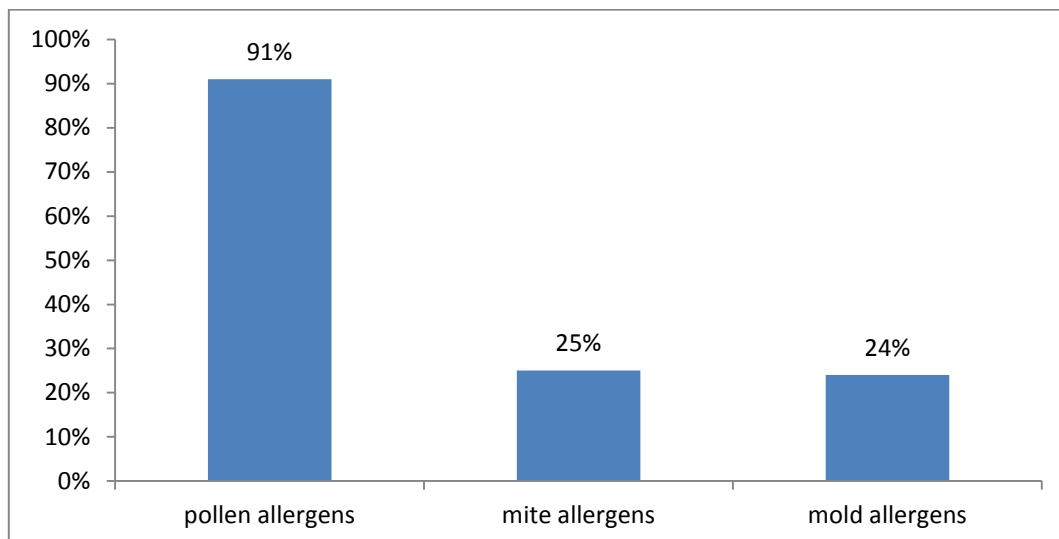
(cladosporium),mould III (penicillium), mould IV(aspergillus) ,candida], Mitesas; [Dermatophagoides pteronyssinus (DP) and Dermatophagoides farina(DF)], these glycerin preservative extract supplied by STALLERGENS SA-France for percutaneous skin tests other inhalants such as House Dust Mite(HDM) genus *Glyciphagus* and date pollen supplied by Allergy vaccine lab. /Iraq for intradermal skin tests.

The allergenic extracts as well as Glycerol buffer and histamine (negative and positive controls respectively) were placed on their corresponding places the volar aspect of forearm as labelled by a pen and introduced into the epidermis by a disposable hypodermic needles from Staller Genes SA-France Company while Intradermal test for HDM and date pollen was done by injection of allergen extract intercutaneously by using insulin syringe.Skin reactions measured 15-20 minutes after the pricks and any reaction measuring ≥ 3 mm than the negative control is regarded as positive sensitivity to that allergen (6).

Statistical analysis was done by using the statistical package for social sciences (SPSS) version 22.

RESULTS

skin test to common allergens was positive in 112(87.5%) of patients, Figure(1) shows the frequency of the main aeroallergens groups(pollen, mite and mold) in patients with respiratory allergy according to skin prick test results, 91% of patients were sensitized to different types of pollens, and 25% & 24% of them were sensitized to different kinds of tested mites or molds allergens respectively.



Figure(1): Percent of patients sensitization to main allergen groups by skin prick test.

Table (1) shows the frequency of each individual allergens, the results revealed high percent of sensitization to tree pollens especially date palm pollens 48.2% followed by grass pollens which represented by Bermuda 31% & five grasses 26.7%.more than 23% show sensitization to HDM while other species of mite and alternaria mold found in approximately 9% of patients.

Table (1): The frequency of individual allergens in the positive skin test patients

Allergan group	allergen	Patients (n=112)	
		No.	%
mite	HDM	26	23.2%
	Der. pteronyssinus	6	5.3%
	Der. farinae(DF)	4	3.5%
Grass pollen	Bermuda	35	31%
	five grasses	30	26.7%
Weed pollen	mugwort	10	9%
	plantain	19	17%
	chenopodium	29	25.8%
Tree pollen	Date pollen	54	48.2%
	tree I(fagacea)	20	17.8%
	tree II(oleaacea)	21	18.7%
	tree III(butulacea)	11	9.8%
mold	mouldI (alternaria)	10	8.9%
	mouldII(cladosporium)	6	5.3%
	mould III (penicillium)	5	4.4%
	mould IV (candida)	7	6.2%

Table(2) shows that only 25.8% of patients showed sensitization to one allergens while the majority of patients exhibited polysensitization pattern

Table (2):The pattern of sensitization according to sensitized allergens number by skin prick test:

Prick test response	Patients(n=112)
Positive to one allergen	29(25.8%)
2+	38(33.9%)
3+	37(33%)
4+ and above	8(7%)
Total	112(100%)

Figure (2) shows no significant difference between male & female regarding skin reactivity as 66.3% &67.4% respectively had positive test.

however the skin reactivity was more in young age group (25-34)&(35-44) years compared with others(p<0.05). Figure (3)

Figure (4) reveals that housewives and employers had high percent of skin positivity in comparison to others with free jobs or students, the percent of mite sensitization more common in housewives 50% followed by employer 35% and 7% in free workers and students.

Figure (5) show that people live in urban area show skin test reactivity more than those live in rural area (66.9% vs 33%) with significant difference(p<0.05).

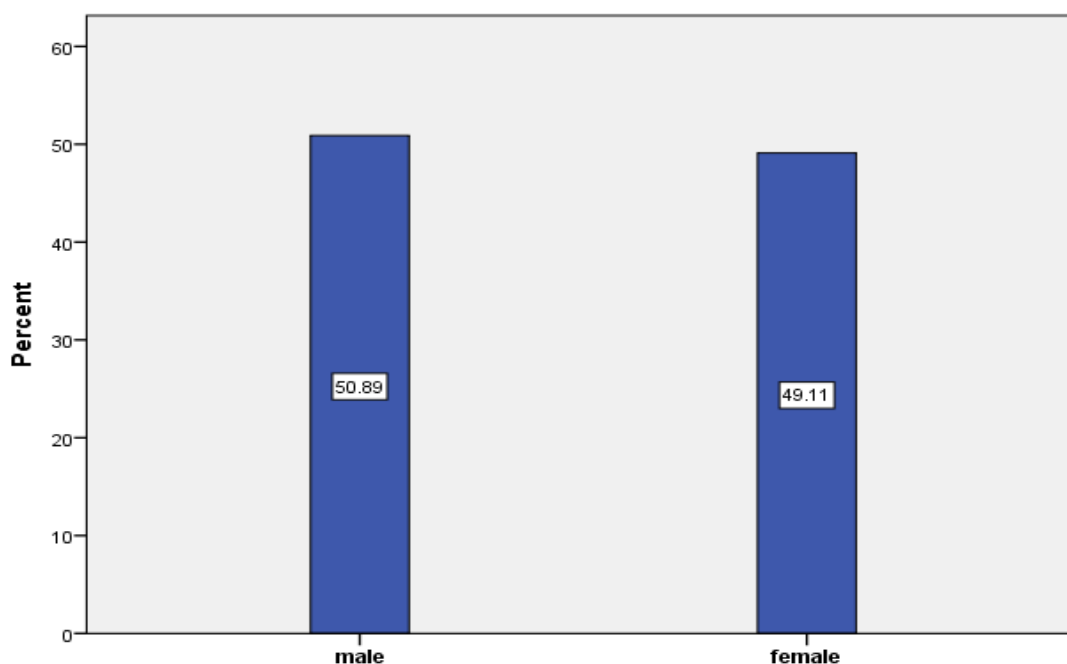


Figure (2): Distribution of skin reactivity according gender

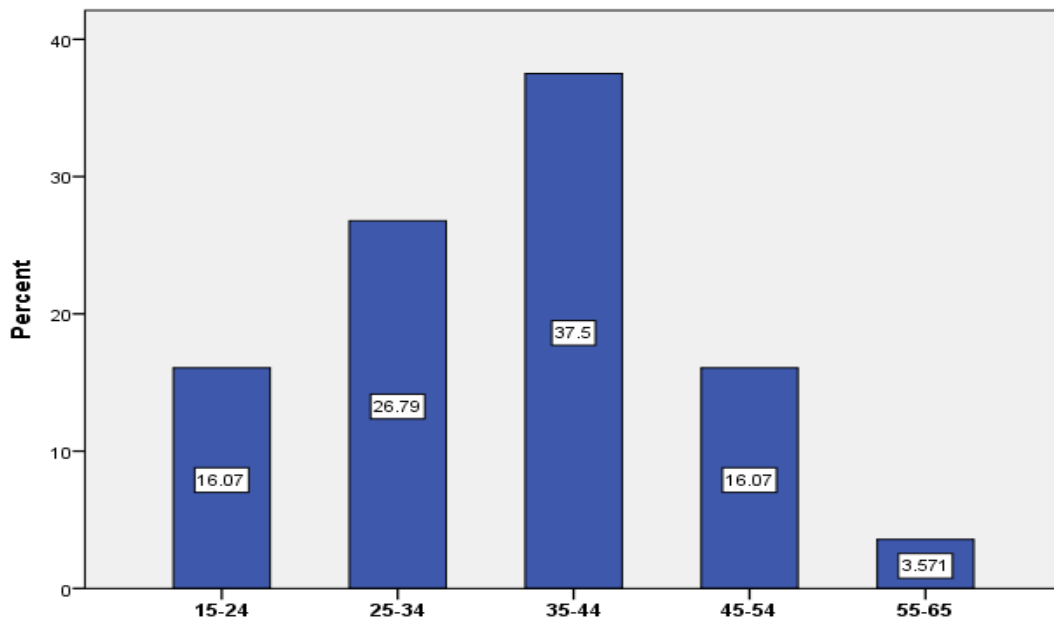
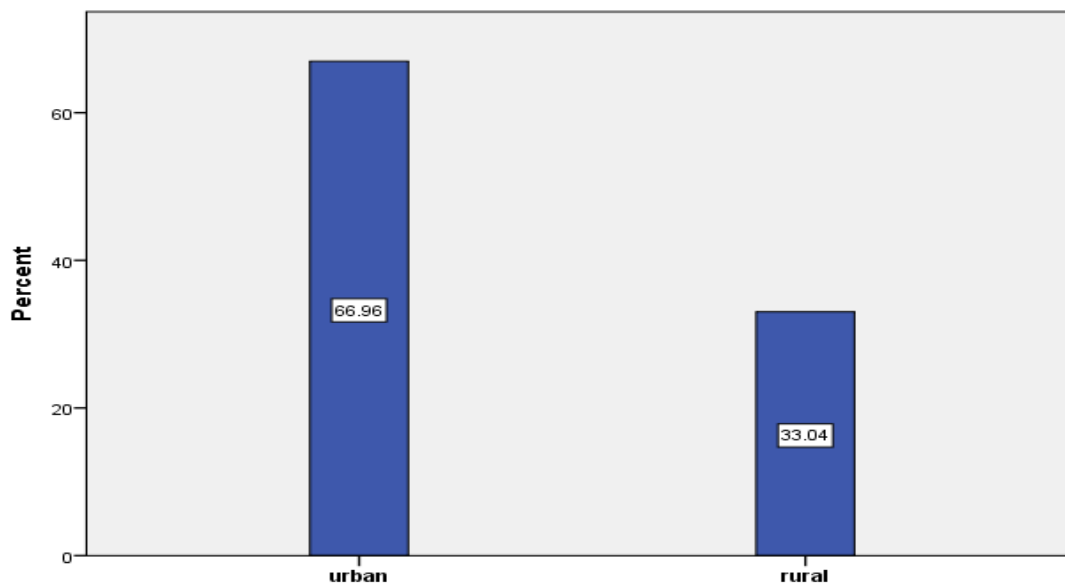


Figure (3): Distribution of skin test reactivity according to age groups



Figure(4):Distribution of sensitized allergen group according to occupation.



Figure(5): Distribution of skin test positive patients according to residency

DISCUSSION

Skin test was positive in 87.5% of case that were clinically suspected to have respiratory allergy and pollen constitute the major sensitizing aeroallergen ,(91%) of patients , although this percent is to some extent high but still agree with studies of Saleh *etal*(7)in Salahelden Governorate(65%), Ezeamuzie *etal*(8) in Kuwait (87.1%) where they regarded pollens as the major allergens and Assarehzadegan *etal* (9) in Iran (90%). The interpretation of higher frequency of sensitivities to pollens maybe related to the great varieties of plants in our region, also there are 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.

The study demonstrates that (25.5%) of the sensitized patients were monosensitized against one allergen and others were polysensitized to more than one allergen, (33.9%) sensitized to 2 allergen and (33%) sensitized against 3 allergens, this agree with study in Tikrit province that show 13% of patients were monosensitized , 30% sensitized to 2 allergen & 45% sensitized to 3 allergens (7), Koshak from Saudi Arabia reported that (17%) of patients were monosensitized, (39%) sensitized against 2 allergens and (40%) had sensitization against 3 allergens(10), also in Jordan, researchers reported (17.6%) of allergic patients were monosensitized & (81.4%) were reactive to 2 or more allergens (11) while study in Iran reports that (88%) of patients were monosensitized, (3%) sensitized against 2 allergens and (2%) sensitized against 3 allergens (12).

The exact prevalence depends on the population and the region, Polysensitization might be the result of genetic factors (13) or environmental factors which favor growth and vegetation of specific plant species such as grass and weeds with similar survival conditions (12). It might also be due to cross-reactivity which reflects the presence of common allergenic epitopes in different but botanically close species (14,15).

The most common type of pollen was tree pollen followed by grass and weeds, 94%, 58%, 51.8% respectively and among the more frequent tree pollens was date palm pollen(48.2%), While Alwan study in Diyala the only available study that test the allergy against date pollen ,reports date pollen allergy in (12%) of patients(16) , this may be explained by the wide spread of date palm tree in Al-Najaf city in comparison to Diyala.

The second common type of pollen was Bermuda grass pollen (31%), followed by the weed pollen of Chenopodium (25.8%) , this result is consist with the finding of local studies conducted

in Tikrit & Diyala province that show a percent of (36%), (23%) for sensitization to Bermuda pollen (7,16) While studies by Fatimah *etal*, (17) in Iran and Hasnain *etal*,(18) in Saudi Arabia revealed the highest degree of sensitization to weeds not to grasses.

Difference in sensitization rates among pollens which belong to horticultural plants that were imported for the purpose of “greening” the desert areas (8). Also herbal geography, climate and temperature are responsible for these variations.

Twenty five percent of our patient show sensitivity to different types of mite , studies conducted in Iraq by Alwan (16), AL-Tae (19) show similar percent (23%) regarding sensitivity to dust mite antigens especially HDM genus *Glycyfagas* that included for Iraqi patient testing. Der.Petronyssinus (d.pet) & Der. Farinae (d.f) were less common in our patients. Dakhllalla recorded that house dust mite was not the markedly positive antigen in Iraq(20).

As the mite need humidity and moderate temperature to grow, Surprisingly, mite allergens were found in Iraq and several nearby hot & dry countries like Saudi Arabia asthmatic patients (10) Qatar (21) and Kuwait (8), the Sistan and Baluchestan province of Iran (22), This might be related to the common use of air conditioners inside the houses which produces a good environment for mites to grow and increases exposure to indoor allergens (23).

Concerning molds prevalence , our study recorded it as the third important sources of allergens after mites (24%) and the most common mold was alternaria ,our result going with Alwan(16)in Diyala,(24%) and slightly higher than (24) in Tikrit , (17%) and relatively lower than what was reported in Iran(35%) and in Jorden (40%), (9,11).

The fungi are both indoor and outdoor allergens and live in the less humid regions the previous publications confirmed that fungi such as *Cladosporium*, *Alternaria* or *Penicillium* are transported by airborne dust (25,26). This could be a reason for an increase of its prevalence in the city because of the dust storms in the region.

No statistically significant difference was found between the rate of positive skin reaction to allergens and patients' gender. This finding was consistent with the results of the study conducted by Mahram *etal.*, (27) and Assarehzadegan *etal* (9) and it was inconsistent with the study conducted by Kashef *etal* (28). In general, there is no agreement on the role played by sex in skin test reactivity according to the literatures(29).

Young age group was the most prevalent in positive test, this agree with Saleh (24). The higher prevalence rate of skin prick reactivity in the younger age groups can represent either a process of maturation of immunological reactivity, or a longer exposure to environmental allergens in this age group. On the contrary, the decline of skin prick reactivity in the older age groups can be explained by either a real decline of immunological reactivity or due to a decrease of the skin's capacity to react to immunological solicitations. A loss of vascular bed and a reduction in histamine release were observed in the skin of older adults(30).

Concerning the occupation, the study reveal that the highest prevalence of skin test reactivity was among house wives patient (34%)& officer (33%). Housewife was more sensitized to indoor allergens (mites& mold) this because they spend most of their time in the house and exposed more to the indoor allergens such as (mite, mold) that are found throughout the house, including beds, furniture and carpets, (31).The furniture and air conditioning in the office may contributed to increase exposure to indoor allergen in work place of employers.

Approximately (67%) of our sensitized patients were resident in urban area, agree with Warm *etal* (32) actually this go with the general explanation of increase allergies in cities population of middle east countries because of pollutants, dust storms have been an important source of air pollution resources in many countries in the Middle East as it carry pollen particles and mold spores to very long distance even from neighboring countries resulting in an increase in the frequency of emergency department visits and hospitalizations caused by respiratory allergies, particularly asthma (33). Importations of different plants & trees that add allergens load, also most if not all house in urban area are carpeted and use air conditioning which favor growing of mite & fungi (34).

CONCLUSIONS

1. Trees, grasses and weeds pollens were the most common aeroallergens in our patients with allergic symptoms , modern life style and greening the streets and parks with different imported plants are responsible for increase allergy diseases in our city.
2. Young age, housewife, urban residency and family history associated with increase risk of respiratory allergy.

RECOMMENDATIONS

1. Determination the prevalence of the most common aeroallergens in different Iraqi cities with larger sample size help to select the most appropriate panel of allergen extracts to Iraqi patients, this will improve diagnosis and management of allergic Diseases by avoiding the offender allergens or immune therapy in severe symptoms.
2. pollen allergens(weather Trees, grasses or weed spollen) should be given the highest priority when educating allergic patients regarding allergen avoidance strategies.

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