

Atopic allergy resulted from exposure to HDM allergens in Amara city: southern Iraq

Younus Jasim Abdullah

Assis. Lecturer. Amara Technical Institute . Nursing Dept.

Abstract

House dust mites (HDM) are small creatures that live indoor in warm, moist places. Several studies found that HDM are important sources of airborne allergens that cause different allergic symptoms all over the world. With this mind, 200 persons suffering from different allergic symptoms were randomly selected in the current study aged between 7-60 years old from both gender. They all subjected to skin prick test by using standard allergen solution for HDM allergens *Dermatophagoides farinae* (D.F) and *Dermatophagoides pteronussinus* (D.P). The results showed that most frequent allergic disease related to exposure to HDM was asthma and allergic bronchitis(33 % and 28% respectively). Female sex have the higher percentage of response(61%) than males(39%). Also, the urban society were more sensitive than rural. Furthermore, workers were more allergic than employees. In conclusion: we observed that sensitization to HDM allergens is associated with airways allergy such as asthma and allergic bronchitis especially in females and workers. In addition the allergic symptoms increase with urbanization.

التحسس المتماحل الناتج عن التعرض لمحسسات حلم الغبار المنزلي في مدينة العمارة ، جنوبي العراق

يونس جاسم عبد الله

مدرس مساعد - المعهد التقني عمارة - قسم التمريض

الخلاصة

حلم الغبار المنزلي كائنات صغيرة تعيش داخل البيوت في الاماكن الحارة والرطوبة . وقد رصدت العديد من الدراسات ان حلم الغبار المنزلي هي مصدر مهم للمحسسات الهوائية حول العالم وتسبب اعراضا مختلفة للتحسس الآني. لذا اختيرت عينة عشوائية مكونة من ٢٠٠ شخصاً من الذين يعانون من اعراض مختلفة للتحسس الآني تراوحت اعمارهم بين ٧-٦٠ سنة ومن كلا الجنسين . خضعوا جميعا لاختبار خدش الجلد باستخدام محاليل قياسية لمحسسات حلم الغبار المنزلي للنوعين *Dermatophagoides pteronussinus* (D.P) و *Dermatophagoides farinae* (D.F) . اوضحت النتائج ان اكثر اعراض التحسس الناتجة عن التعرض لمحسسات حلم الغبار المنزلي كان الربو وحساسية القصبات الهوائية بنسب مئوية (٣٣ % و ٢٨ % على التوالي) ، وكانت الاناث اكثر عرضة للتحسس (٦١%) من الذكور (٣٩%) كما ان مجتمع المدينة كان اكثر تحسسا من مجتمع الريف بالإضافة الى ان العمال كانوا اكثر عرضة للتحسس من الموظفين . وفي الاستنتاج : لوحظ ان التحسس الناتج عن حلم الغبار المنزلي يرتبط مع حساسية الممرات التنفسية مثل الربو وحساسية القصبات الهوائية وخاصة لدى جنس الاناث والعمال كما تزداد اعراض التحسس الآني مع زيادة التمدن .

Introduction

House dust mites (HDM) have been shown to be important sources of airborne allergens world wide associated with asthma , allergic rhinitis , allergic bronchitis and other allergic diseases (1). Allergy to HDM is a condition affects millions of people all over the world . HDM sensitization affects more than 15-20 in the house dust, however, there are differences in the mites number and allergen concentration in different locations and seasons. In temperate regions *Dermatophagoides pteronussinus* (D.P) and

% of the general population from industrialized countries , moreover , 90 % of individual suffering from allergic asthma are sensitive to HDM. The severity of the problem is rising and there is about 45% of young people showing sensitivity (2) The allergen exposure degree can be estimated by the number of mites and the concentration of their allergens detected *Dermatophagoides farinae* (D.F) were the most commonly species found , while in tropical and subtropical areas *Dermatophagoides pteronussinus* and *Blomia tropicalis* were the most frequent species found

(3). In addition, considerable variation within and between different homes has shown that factors like age of the home , floor level, ventilation . orientation and living habits of the occupants , may contribute to the differences in door humidity that influence the growth conditions of mites, hence, the mite concentrations are higher in dust from floors with carpets than without carpets. This is may be due to the mechanical protective properties of the carpets (4).In Iraq we have shown in previous study that D.F and D.P are the most common allergens in Mosul city (North of Iraq) causing different allergic diseases (5), so , the aim of the current study is to evaluate the allergic diseases caused by HDM allergens in Amara city (Southern Iraq) .

Materials and Methods

200 patients suffering from different allergic symptoms were randomly selected in the present study

(39 % Males , 61% Females) aged between 7-60 years old in the period Feb._ September 2013 in Amara city .Sothern Iraq . They all subjected to skin prick test by using standard allergen solution for HDM allergens D.F and D.P (performed by stallergen France company , 2013). Skin prick test was done as mentioned by (5).

Statistical analysis :

Frequency and percentage tests used to analyses the results by using SPSS V.17 program .

Results

Figure (1) shows that most frequent allergic disease related to exposure HDM allergens was asthma in a percentage reached (33%) followed by allergic bronchitis(28%) then atopic dermatitis and allergic rhinitis (27% and 12%) respectively .

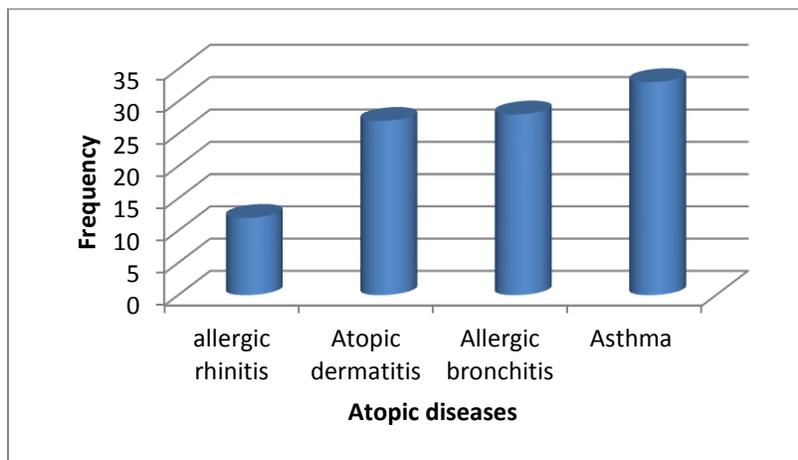


Figure (1) percentage of allergic diseases caused by HDM

The results of this study found , as shown in table (1), that females are more sensitive (61%) than males (39%) to HDM allergens , also , the patients from urban environment have the higher response (79%) than patients from rural (21%) , in addition, the results showed that workers(70%) are more sensitive than government employees (30%) .

Table (1) Correlation of gender , profession and urbanization with allergic reaction

Parameters		Percentage %
Gender	Female	61
	Male	39
Urbanization	Urban	79
	Rural	21
Profession	Workers	70
	Employees	30

The results of Figure (2) presents the frequencies of HDM allergens according to skin test response of patients which shows that response to D.F allergen was higher (67%) than response to D.P allergen (33%).

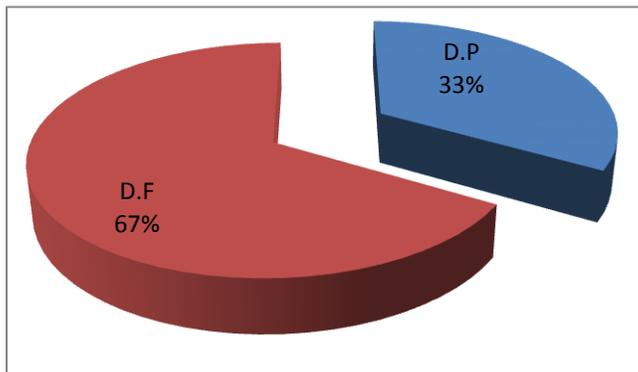


Figure (2) Percentage of skin response to HDM allergens under studying

The results also found that (69.7 %) of the patients were sensitive to one of the two allergens used in the current study (43.5 % males, 56.5 % females), while, (30.3 %) of the patients responded to one allergen (26.7 males, 73.3 females) as shown in Table (2) and Figure (3) .

Table (2) Percentage of response to the number of allergens according to gender

Percentage of response to one allergen (69.7%)		Percentage of response to two allergens (30.3%)	
Males	Females	Males	Females
43.50%	56.50%	26.70%	73.30%

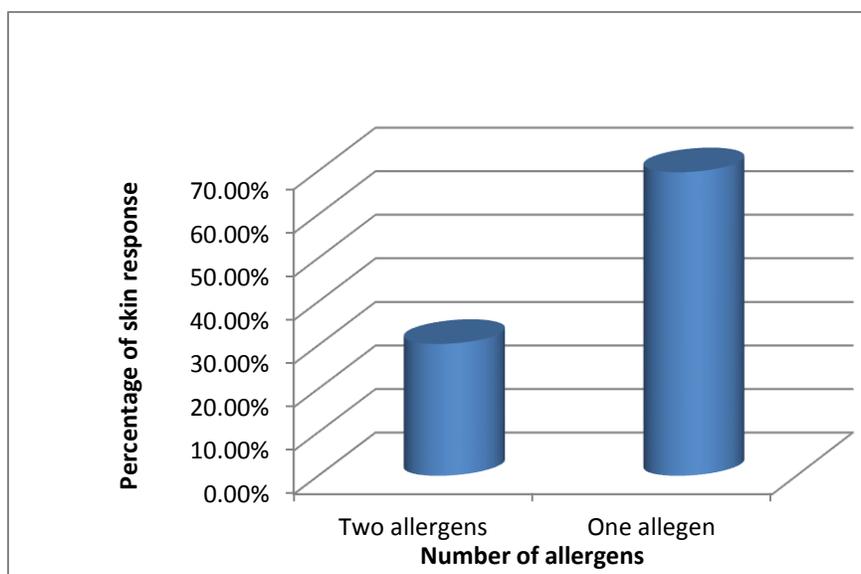


Figure (3) Percentage of response according to the number of allergens

Patients place of living and its effect on the type of responded allergen were considered in the this study and the results showed that ,in urban society , the percentage of response to D.F and D.P allergens was (77.4 % and 73.2 %) respectively, while, in rural environment the percentage of response to the same allergens was (22.6 % and 26.8 %) respectively.We also correlate between gender and HDM related allergic diseases and the results showed female gender had the higher percentage of infection to asthma and other allergic diseases shown in Table (3) .

Table (3) the correlation between HDM related allergic diseases and gender

Percentage of response		Allergic diseases
Males	Females	
36%	64%	Atopic Asthma
47%	53%	Allergic Bronchitis
30%	70%	Allergic Rhinitis
47%	53%	Atopic Dermatitis

The results also discussed the relation between living environment and HDM related allergic diseases and found that city dwellers patients had the higher percentage to infect with allergy than village dwellers as shown in Table (4).

Table (4) correlation between living environment and HDM allergic diseases

Percentage of response		Allergic diseases
City %	Village %	
78.6	21.4	Atopic Asthma
84.5	15.5	Allergic Bronchitis
75	30	Allergic Rhinitis
74	26	Atopic Dermatitis

Discussion

House dust mites are very small creatures that live indoor in warm, moist places. These creatures are not of bugs that can spotted and crushed. Being invisible to unaided eyes their translucent bodies further hinder their visibility. It was established that HDM play a central role in allergic reaction especially asthma and allergic rhinitis. The present study observed that there is an association between exposure and sensitization to HDM allergens and airways allergic symptoms (Figure1) in Amara city (southern Iraq) where the

humidity and temperate climate. This could be interpreted by repeated sandstorms blustery. In this context, in study achieved by (6),it is concluded that increased sensitization to HDM allergens associated with higher levels of asthma severity. It is also found exposures to HDM allergens different percentage of allergic symptoms ranged between 31.9 % for asthma, 29.52% for allergic rhinitis and 20.47 for atopic dermatitis(7). The differences in this respect might resulted from separated geographic regions in additions to genetic-environment factors (8). Considering the effect of gender to allergy, the current study found that female sex were at high risk to be infected by allergic reaction (tables : 1,2,3). This is might due to long periods females spent at houses cleaning carpets and house furnishings which are a rich sources of HDM allergens. Also, women exhibit stronger antibody response to immunization and infection and have higher levels of all antibody classes except IgG. Globally , it is documented that estrogens depress T-cell dependent immune function but enhance T-cell immune response. It is plausible that proinflammatory properties of female sex steroids increase susceptibility to atopy. Moreover, it is also found that males are more likely to have allergy than females during the early life stages but the case reflects with aging and the incidence of allergy increases in females especially after puberty (9,10,11).On the other hand our results found that sensitization to HDM allergens increases in the urban when compared to rural environment (tables : 1,4). Generally urbanization has consistently been associated with high prevalence of allergy and asthma. This association may be explained by decreased exposure to allergens leading to lower tolerance to allergens and increased susceptibility to allergic disease: a reverse case of immunotherapy. Thus , the rising trends in allergy could, in part, be interpreted by changes towards urban life style including exposure to lower doses of allergens due to more time spent indoor and away from areas abundant in natural sources of allergens (12,13). Nevertheless , farming, animals and endotoxins, pets and parasites, air pollution, hygiene, infection and immunization, breast feeding, unpasteurized milk and diet, affluence, house construction and bedding, domestic fuel and smoking, family history and genetic variations are all pieces of allergy puzzle in urban (14). When highlighted patients profession and its relationship to allergic diseases, we found that most allergic persons are workers (table 1). This might be explained by long periods of workers being exposed to

HDM allergens in work place besides to the low health awareness and bad physical conditions in work places especially cement and brick plants scattered in open areas. Moreover, it is observed hypersensitivity from environmental exposure in the work places could produce respiratory and skin disorders. Numerous inhalants cause bronchial asthma and allergic rhinitis in a distinct segment (10-20%) of workers. Also, some workers have a genetic predisposition to be allergic to certain occupational allergens. Furthermore, workers according to work places might exposed to different allergic triggers like pollens, HDM, fungi spores and chemical irritant such as So₂, No₂, Co and others (15,16).The results of this study showed that (30.3 %) of patients were sensitive for two allergens (mostly female). This may be due to the cross-reaction between the two allergens and genetic factors of patients or other factors such as gender and age. In this context it was found that polysensitization may be related changes in the hormonal environment, environmental factor and behavioral factors (17,18).

Conclusion

Sensitization to HDM allergens was associated primarily with asthma and allergic bronchitis. Female sex, according to their hormones and environment, at high risk to be infected by allergic diseases. In the context of genetic – environment reaction workers according to work places have high percentage of response to HDM allergens. Nevertheless, allergic sensitization increases by urbanization. We suggest to study the sensitization to molds allergens in humid city like Basra , southern of Iraq

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