A Comparison between the Efficiency of an Iraqi and French Aeroallergens Skin Test (House Dust and House Dust Mites)

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Summary:

Background: *Allergic diseases constitute a major health problem and it is an important cause of morbidity in modern societies. Immediate skin test has been used to assess clinical allergic disease.*

Objectives: *The present study is an attempt to compare between the efficiency of an Iraqi and a French skin test aeroallergens including house dust (HD) and house dust mites (HDM)*

Subject & methods: *Two hundred patients with symptoms suggestive of respiratory allergy (asthma and or rhinitis), and 50 apparently non-allergic controls were skin tested with a panel of four aeroallergens extracts in addition to positive (histamine) and negative control solutions. Personal and family histories of allergy were taken, and clinical examination was done on the subjects included in the study.*

Results: *The findings were the followings:*

1-Reactivity to each individual allergen was more common in patients than in controls.

2-French HD allergen was more sensitive and efficient than the Iraqi one, while Iraqi and French HDM showed low sensitivity and specificity.

3-Positive skin test was more frequently associated with positive family history of allergy than negative skin test..

Conclusion: *The present data demonstrated a clear correlation between positive and negative skin test and positive and negative family history of allergy both in patients and controls.*

Keywords: *Skin test, house dust, house dust mites and IgE.*

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Introduction:

Atopy is a multifactorial disease, the pathogenesis of which is influenced by both genetic and environmental factors. Genes in the HLA region have been involved in the control of IgE response (1).

Allergic diseases constitute a major health problem and it is an important cause of morbidity in modern societies. About one of 10 persons in the U.S.A suffers from symptomatic atopic disease. Asthma and rhinitis are the third leading cause of limited activity in persons under 45 years of old in north America, and have a considerable impact on school attendance of children, on the annual loss of work in adults, and on the quality of life of patients and their families (2).

Immediate skin test has been used to assess clinical allergic disease, and it is regarded as a routine diagnostic procedure in every day practice (3). It is a useful objective clinical method for the determination of whether a clinical syndrome has an allergic etiology, and also it is important because prophylactic and therapeutic interventions can be used once an allergic cause has been identified (4&5).

The present study is an attempt to compare between the efficiency of an Iraqi and a French skin test aeroallergens including HD and HDM.

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Materials and methods

A total of 250 subjects were seen during the period between June and August 1998, they included 200 patients and 50 controls that were seen at Specialized Center of Allergic and Asthma Disease.

A short personal and family history was taken at the beginning, and careful physical examination was done. Then intradermal (I.D.) skin test was carried out on all subjects, the valor surface of the right forearm was used for testing. Two hundred patients having clinical features suggestive of respiratory allergy were included in this study [83 patients with rhinitis (42%), 65 with asthma (32%) and 52 with asthma and rhinitis (26%)].

All patients included in this study were on no medication (antihistamine or steroids) for at least 72 hours prior to skin testing and had not received immunotherapy before (6,7&8).

Allergy skin tests were carried out according to I.D. technique using four tests that include a variety of allergens plus control. Commercially available skin test materials were used (supplied by Staller genes-Pasteur laboratories-France and The Vaccine laboratory in Al-Jadria, Baghdad), and according to Pasteur Institute method, all in aqueous forms. The allergens
used in the 4 tests included, Iraqi HD, Iraqi HDM, French HD and French HDM. These allergens were

originally supplied in a concentration of 1/1000; they were diluted 10 times by adding 1 ml of original extract onto 9ml of physiologic phenol to get a concentration of 1/1000 of the allergic extract.

Histamine was used as a positive control solution in concentration of 1/10000. All these reactions were read after 30 minutes starting with histamine controls (8), and the subjects was regarded skin test positive when the wheal size^ 50% of histamine reaction (9). Data were analyzed using chi-square test and student's t-test, p-value < 0.05 were considered significant.

Results

As shown in table 1, reactivity to Iraqi and French HD and HDM aeroallergens were the most common in the patients' population (28%), while the least reactions were to Iraqi HDM (2.6%) and French HDM (3.5%) respectively. In the control group, the highest reactivity was to French HD (37.5%), and the least reactivity was to the Iraqi HDM (no reaction).

Table 2, shows that a positive family history of allergy was significantly more common in the patient than in the control group ($p < 0.001$). It was also significantly more common in skin test positive patient than in skin test positive control ($p < 0.001$) and in skin test negative patient than in skin test negative control ($p < 0.001$).

Evaluation of skin test reactivity to Iraqi and French HD and HDM are shown in table 3 and 4, respectively. French HD allergy is more sensitive while the Iraqi one is more specific, however, the French HD appear to be more efficient. On the other hand Iraqi and French HDM show no significant difference in their sensitivity, specificity and efficiency.

Table 1- The prevalence of different allergen skin test reaction in patients and control population

Allergens	Patients		Control		Total	
	No.	(%)	No.	(%)	No.	(%)
HD(F)	21	(18.5)	6	(37.5)	27	(21)
HDM(F)	4	(3.5)	1	(6.2)	5	(4)
HD+HDM (F)	9	(7.8)	2	(12.5)	11	(8)
HD(I)	7	(6.2)	2	(12.5)	9	(7)
HDM(I)	3	(2.6)	0	(o)	3	(2)
HD (I&F)	24	(21)	3	(8.7)	27	(21)
HD+HDM (I&F)	32	(28)	1	(6.2)	33	(25)
HD+HDM (F) +HD (I)	14	(12.3)	1	(6.2)	15	(12)
Total	114	(100)	16	(100)	130	(100)

(F) –French
(I)-Iraqi

Table 2- Correlation between family history of allergy and skin test reactivity

Subject	Positive family history		Negative family history	
	No.	(%)	No.	(%)
Patients (1)	148	(74)	52	(26)
Skin test positive (a)	85	(74.6)	29	(25.4)
Skin test negative (b)	63	(73.3)	23	(26.7)
Controls (2)	14	(28)	36	(72)
Skin test positive (c)	5	(31.3)	11	(68.7)
Skin test negative (d)	9	(26.4)	25	(73.6)

P value < ft *001 for (1) VS (2) (a) VS(c) (b) VS (d)*

Table 3- Skin test reactivity to Iraqi and French HD in relation to family history of allergy in patients

Family history	Iraqi HD		French HD	
	Positive skin test	Negative skin test	Positive skin test	Negative skin test
Positive	61	87	88	60
Negative	15	37	23	29

	Sensitivity	Specificity	Efficiency
Iraqi	41%	71%	49%
French	59.5%	56%	58.5%

Table 4- Skin reactivity to Iraqi and French HDM in relation to family history of allergy in patients

Family history	Iraqi HDM		French HDM	
	Positive skin test	Negative skin test	Positive skin test	Negative skin test
Positive	42	106	48	100
Negative	17	35	20	32

	Sensitivity	Specificity	Efficiency
Iraqi	28%	67%	38.5%
French	32%	62%	40%

Discussion

In spite of the progress achieved in allergy diagnosis, immediate skin test remained the most convenient test in every day clinical practice.

In this study, subjects reacted to Iraqi and French HD more frequently than to other allergen (HDM). Most skin test positive patients and controls showed positive reactions to French HD.

In general, reactivity to HD by allergic and control individuals is in agreement with data reported by Safar (1992) and Naseeif (1990) who performed their studies in Baghdad and Mosul respectively (9&10). HD reactivity was not always accompanied by reactivity to HDM in this study. This is in agreement with Safar, Naseeif and Al-Niami (1990) in Iraq, but not consistent with Chew et al (1999) in Singapore, Kemp et al (1997) in U.S.A. and Hill et al (1997) in Australia (11,12&13). This may be explained by possible low incidence of HDM in our country due to a drier weather than in western countries, and to the habits of sleeping in open air and removing the carpets in summer, which are important in the life cycle of mites.

In this study skin testing was done by intradermal method, which is slightly better than prick test, as intradermal techniques are generally used when increased test reliability, sensitivity and reproducibility are the main goals of testing (15). The present study showed that French HD is more sensitive and efficient than Iraqi HD; however Iraqi and French preparations of HDM showed low sensitivity and efficiency. This can be explained by the presence of impurities, contaminants, or non-specific mast cells, which may affect positive results of the test. Further more both false positive and false negative skin tests may occur because of improper technique or material. False positive reactors may be caused by irritants, or may result from demographism. False negative reactors may result from extracts of poor initial potency, medication suppression, skin disease or decreased skin reactivity in children and elderly (16).

The present data demonstrated a clear correlation between skin test and family history of allergy both in patients and controls. Similarly, Muallaa (1993), Al-Sarraf (1989) and Poysa (1989) also reported such a correlation in contrast to the findings of Hagy and Settipipane (1969) and Lindlad and Farr (1961) (17, 18, 19, 20&21).

References

1. *Torres G., Quiralte J., Blanco C. and Gastillo R. (1999); Linkage of house dust mite allergy with the HLA region. Ann. Allergy – Asthma Immunol. 82(2): 198-203.*
2. *Massicot J.G. and Coh S.G. (1986); Epidemiologic and socioeconomicaspects of allergic diseases. J. All. Clin. Immunol. 78:954.*
3. *Sibbald B., Barnes C. and Durham S.R. (1999); Skin prick testing in general practice: a pilot study. J. Adv. Nurs. 27(2): 442-4.*
4. *Kanthawatana S., Maturim W. and Fooanan S. (1997); Skin prick reaction and nasal provocation response in diagnosis of nasal allergy to house dust mite. Ann. Allergy-Asthma Immunol. 79(5): 427-30.*
5. *Booth B.H. (1985); Diagnosis of immediate hypersensitivity. In: Allergic Disease Diagnosis and Management. 3rd edition J. B. Lippincolt company.*
6. *Cook T.J., Mao Qween D.M., Wittig H.J. and Thornby J.I. (1973); Degree and duration of skin test suppression and side effect with antihistamines: A second double blind controlled study with five antihistamines. J. All. Clin. Immunol. 51:71.*
7. *Galant S.P. and Maibach H.I. (1973); Reproducibility of allergy epicutaneous test techniques. J. All. Clin. Immunol. 51:245.*
8. *Tipton W.R. and Nelson H.S. (1982); Experience with daily immunotherapy in 59 adult allergic patients. J. All. Clin. Immunol. 69:194.*
9. *Safar N.S. (1992); Evaluation of immediate skin test to aeroallergens in respiratory allergic and non allergic individuals. MSc. thesis, Baghdad.*
10. *Naseeif B.S. (1990); Estimation of total and specific IgE and blood eosinophils in allergic rhinitis. MSc. thesis, Mousl.*
11. *Al-Niami B.F.S. (1990); Immunological assessment of adult male asthmatic patients. MSc. thesis, Baghdad.*
12. *Chew FT., Yi Fc, Chua Ky. and Fernandez GE. (1999); Allergenic differences between the domestic and mites Blomia tropicalis and Dermatophagoides pteronyssinus. Clinical Exp. Allergy 29(7): 932-8.*
13. *Kemp S.F., Lockey R.F., Fernandez G. and Arlian L.G. (1997); Skin test and cross reactivity studies with Euroglyphus maynei and Dermatophagoides pteronyssinus. Clin. Exp. Allergy 27(8): 893-7.*
14. *HH1 D>J>, Thompson P.J., Stewart G.A. and Garlin J.B. (1997); The melbourne house dust mite study: eliminating house dust mites in the domestic environment. J. All. Clin. Immunol. 99(3): 323-9.*
15. *Bernstein IX. (1988); Proceeding of the task force on guidelines for standardizing old and new technologias used for the diagnosis and treatment of allergic diseases. J. All. Clin. Immunol. 82: 487.*
16. *Bosquet J. (1988); In vivo methods for study of allergy: Skin tests techniques, and interpretation. In. Allergy Principles and Practice. The C. V. Mosby Company.*
17. *Mualah H.K. (1993); Skin test reactivity to date palm pollen in asthmatic and allergic rhinitis patients. MSc. Thesis, Baghdad.*
18. *Al-Sarraf M.M.A. (1989); Immunological assessment of adult male asthmatic patients. MSc. Thesis, Baghdad.*
19. *Poysa L. (1989); Atopy in children with and without family history of atopy. In. Skin reactivity. Acta. Paediat. Scand. 78: 902.*
20. *Hagy G.W. and Settipipane G.A. (1969); Bronchial asthma, allergic rhinitis and allergy skin test among college students. J. Allergy 44: 323.*
21. *Lindblad J.H. and Farr R.S. (1961); The incidence of positive intradermal reactions and demonstration of skin sensitivity antibody to extracts of ragweed and dust in human without history of rhinitis or asthma. J. Allergy 32: 392.*