Original Article

A study of intradermal testing with aeroallergens in patients with chronic urticaria in a tertiary care centre

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Abstract

Background: Chronic urticaria affects upto 1% of the population, and in most cases lesions occur spontaneously without an obvious identifiable external cause. Numerous articles have been published citing the role of aeroallergens in chronic urticaria. Proper controlled trials delineating the pattern of aeroallergen sensitivity and defining its association with the disease are lacking **Aim**: To find out a possible association between aeroallergen sensitivity and cases of chronic urticaria in which no cause was identified after assessment with a standard protocol. **Methods**: The sensitivity of chronic urticaria patients to a panel of locally prevalent 35 aeroallergens was studied using intradermal method. **Results:** 90% of patients showed one or more significant positive reaction to the allergens tested and the average number of positive reactions to intradermal tests per person was 11.25. There was no statistically significant difference between the number of positives in dust aggravated and non-dust aggravated urticaria and between men and women. Positivity among different groups of aeroallergens were as follows: insects-86%, pollen-72%, fungi-72% and 42% in the wool, dander and feather group. Among the insects group all individual allergens had high positivity rates, the maximum being for housefly. **Limitations:** The limitation of the study was the small sample size and the absence of control group. **Conclusions:** Majority of chronic urticaria patients had sensitivity to one or more tested antigens, the maximum sensitivity being for insects.
Keywords: aeroallergens, intradermal testing, chronic urticaria.

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INTRODUCTION

Chronic urticaria is defined as urticaria occuring daily or almost daily for more than six weeks. This applies to all patterns of urticaria , but is most relevant to the ordinary presentation of urticaria which is used when predominantly physical, vasculitic and contact urticarias have been excluded. The etiology remains uncertain in most of the cases, though several agents have been implicated as provoking and aggravating urticaria. Occasionally urticaria may be a manifestation of some allergen that is either inhaled, ingested or contacted[1,2]. Nevertheless, the allergen's route of access is an important determinant of the symptoms observed. In general, inhaled allergens cause respiratory symptoms, whereas ingested allergens cause urticaria, angioedema or gastrointestinal reactions. Occasionally, urticaria follows contact of the antigen with the intact skin. The usual aeroallergens implicated are grass pollens[3,4], mould spores[5,6], house dust[7,8,9,10,11] animal dander, tobacco smoke and zinc fumes. Feathers, formaldehyde, arcolein, castor bean or soya bean dust, cooked lentils, cotton seed, cosmetics, aerosols, pyrethrum are also considered as possible aeroallergens[12]. Inhalation of latex laden powder by health professionals is a serious cause of occupational latex asthma and chronic urticaria. Sensitivity to aeroallergens may be detected using skin tests. An allergy screen with a panel of 12-14 antigens shows better sensitivity for detection of allergy. Patients with allergic

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sensitivities will likely react to one of several common antigens tested. In the absence of reaction, the likelihood of the patient having allergic sensitivity to a broader panel of antigens is low. Among the different types of skin testing, intradermal testing is a quantitative, specific, sensitive, safe and reproducible approach to invivo allergy testing. This study is an attempt to throw light into the pattern of aeroallergen positivity in chronic urticaria patients in our population in North Kerala.

MATERIALS AND METHODS

The study was conducted among the patients attending the outpatient section of Department of Dermatology, Venereology and Leprology. Patients of both sexes between 14 and 55 years with a clinical diagnosis of chronic urticaria in whom a cause was not identifiable after history, examination and investigations were subjected to intradermal skin testing. Patients with dermographism, predominant physical urticaria, urticarial vasculitis, local skin disease and serious systemic disease were excluded from the study. Patients with history of atopic diseases like bronchial asthma, allergic rhinitis or atopic dermatitis were also excluded. The selected patients were asked to discontinue antihistamines one week prior and steroids, if any, 3 days prior to the test.

RESULTS

Table 1: grading system used in the study

	Wheal Size	Erythema
Grade 1+	> negative control, but < 3mm more than negative control	<10mm
Grade 2+	3-5mm > negative control	>10mm
Grade 3+	5-10mm > negative control	>10mm
Grade 4+	10mm > negative control or presence of pseudopods	

Table 2: number of positive reactions in patients

No. of Positives	No. of Cases
0 - 5	16
6 - 15	23
16 - 25	9
25 - 35	2

Table 3: Positivity in different allergen groups

Allergen	Positive cases	Percentage
Insects	43	86 %
Pollen	36	72 %
Fungi	36	72 %
Dusts	26	52 %
Dander feathers and wool	21	42 %

Table 4: Frequency of individual allergen in insect group

Allergen	No. of Cases	Percentage
House fly	33	66 %
Mosquito	32	64 %
Cockroach male	31	62 %
Ants	30	60 %
Cockroach female	26	52 %

Table 5: Frequency of individual allergen in pollen group

Allergen	No. of cases	Percentage
Cenchrus	16	32 %
Ricinus communis	16	32 %
Dodonaea	14	28 %
Azadirachta	14	28 %
Ageratum	12	24 %
Argemone	10	20 %
Parthenium	10	20 %
Imperata	9	18 %
Cassia siamea	8	16 %
Adathoda	4	8 %

Table 6: Frequency of individual allergen in fungal group

Allergen	No. of cases	Percentage
Rhizopus	17	34%
Asp. Tamari	16	32%
Asp. Niger	15	30%
Asp. Versicolor	14	28%
Fusarium solanii	14	28%
Alternaria	13	26%
Asp. Flavus	13	26%
Mucor	12	24%
Candida	11	22%
Trichoderma	11	22%
Asp. Fumigates	10	20%
Phomahybernica	10	20%

Table 7: Frequency of individual allergen in dust group

Allergen	No. of cases	Percentage
House dust	14	34 %
Wheat dust	16	32 %
Cotton dust	8	16 %
Paper dust	8	16 %

Table 8: Frequency of individual allergen in dander and miscellaneous group

Allergen	No. of cases	Percentage
Buffalo dander	15	30 %
Cow dander	11	22 %
Chicken feathers	7	14 %
Wool	4	8 %

Table 9: Comparison of number of positive reactions in dust aggravated and non dust aggravated group

	No. of cases	No. of positive	Average number of positive per person
Dust aggravated	11	110	10.00
Non dust aggravated	39	396	10.15

p = 0.769

Table 10: Comparison of number of positive reactions in men and women

	No. of cases	No. of positive	Average number of positive per person
Men	13	157	12.076
Women	37	349	9.43

p = 0.206

Table 11: comparison of aeroallergen positivity with patients having respiratory allergy

Allergen	% of Positive cases	
	Chronic urticaria	Respiratory allergy
Insect	86	82
Dust	52	79
Pollen	72	59
Fungi	72	52
Animal	42	22
Total	**90 %**	**88 %**

Table 12: Comparison of positivity to allergen in insect group with respiratory allergy patients

Insect allergen	% of Positive cases	
	Chronic urticaria	Respiratory allergy
House fly	66	61
Female cockroach	52	43
Male cockroach	62	41
Mosquito	64	30
Ants	60	16

DISCUSSION

As a controlled study was impossible from the ethical standpoint, only comparison with available studies could be done in this situation. Juhlin *et al*[13] studied the pattern of positivity to 36 common allergens which included dander (6), dust (3), food (12), mold mixure (1), plants (7) and pollen (7), in patients having atopic dermatitis and urticaria. He found several positive reactions in most patients in the group with atopic dermatitis. Seventeen patients with chronic urticaria were tested. In this only one patient had history of atopic dermatitis in childhood. He observed that skin reactions to the above allergens were negative in all the cases. Holti in his series of 270 patients with chronic urticaria found that 49 (18 %) reacted to intradermal tests to C**.** albicans, 27 (10 %)reacted to bakers and / or brewers yeast[14]. Clinical cure was produced in 27 of the 49 patients by anticandidal treatment. Caliskaner *et al*[15] in 2004 studied skin prick test positivity to house dust mites and other inhalants in 259 patients with chronic idiopathic urticaria and angioedema but without allergic rhinitis and / or asthma. 56 common aeroallergens (pollen,molds,house dust mites and animal dander) were used. Results were compared with both 300 healthy controls and 300 atopic patients. Immediate cutaneous reactivity to one or more allergens was detected in 71 patients in the study group (27.4 %) . The most common allergen was house dust mite (24.7 %). Skin test positivity to other inhalant allergens including pollens , molds, cockroach were 7.7 %, 0.4 % and 0.8 % respectively. The most common allergens in healthy controls were pollens (6%) and house dust mites (4.7 %). In atopic control group also pollens and mites are the most common allergens (62 % and 50.3 % respectively). The difference between the mite positivity of the study group and healthy control group was statistically significant. House dust mites , pollens, molds, dander and cockroach sensitivity in the study group was not as high as in atopic patients. The higher incidence of positivity in our group compared to the above mentioned urticaria patients under study may be because we had used the more sensitive intradermal method of testing.

As the pattern of aeroallergen testing positivity is influenced greatly by the locally prevalent allergens and the population, a brief review of the conclusions from another study conducted at the same institute seems appropriate for the situation(Table 11). The study consisted of intradermal teating for aeroallergens in 100 patients with respiratory allergy[16]. Majority (88%) of the patients showed significant skin reaction to allergens studied, mostly to insect (82 %) and dust allergens (79 %). Cockroach and housefly were the predominant insect allergens. About half of the patients showed significant reaction to fungal allergens. Skin reaction to animal products were less.Though the total number of positive cases closely correlated, the chronic urticaria group showed less positivity to dust allergen compared to the group with respiratory allergy. Each individual allergen in insect group showed more positives in case of chronic urticaria group(Table 12).

The specificity of skin tests should be taken into account before interpreting the results of any skin tests. Rackermann and Simon[17] tested 60 subjects who had a variety of non allergic complaints, only 4 of whom had history of allergy. Eight different antigens were used. Fifty percent of these subjects gave positive reactions to one or another antigen. Grow and Herman[18] tested a group of 150 apparently normal medical students, of whom 110 had no history of allergy. Thirteen common antigens were employed and 55.5percent of the entire groups showed one or more positive reactions. The incidence of positive reactions in the group with allergy history (56%) and in the nonallergic group(54.5) was almost similar. Lindblad and Farr[19] studied skin reactions in 100 normal subjects with 5 inhalant antigens: ragweed, dust, mixed trees, mixed grasses and mixed molds. Upto 50 percent showed positive reactions, dependind on the dosage employed. These studies indicate that positive skin tests are not necessarily proof of allergic disease and may occur in apparently normal individuals. Efron and

Boatner[20] studied skin reactions to house dust and ragweed in normal and allergic individuals, and reported a higher incidence in the latter group as compared to the former. Vincent *et al*[21] compared the skin sensitivity to allergens in 200 allergic and non allergic children. Among normal children 42% reacted to house dust, 20% to strawberry, 18% to spinach, 11% to chocolate and 7% to feathers. In the allergic group, the highest found percentage of positive reaction was found with the house dust(88%). The spate of reports on the specificity of intradermal tests suggest that a positive reaction may be obtained in upto 55% of normal individuals. The most common allergen implicated in these studies was the house dust. In this study the reactivity to intradermal test was 90% among the chronic urticaria patients. In a similar study from the same institution among patients with respiratory allergy, reactivity to intradermal test was 88%. Therefore there is an evident increase in the reactivity in patients with both these conditions when compared to normal population. Also in both chronic urticaria and respiratory allergy, the insect group which constitute the major component of the house dust was the most common allergen.

SUMMARY AND CONCLUSIONS

90% of chronic urticaria under study patients showed one or more significant positive reaction to the allergens tested. The average number of positive reactions per person was 11.25 and there were total 506 positives. Only two patients had more than 25 positives. There was no statistically significant difference between the number of positives in dust aggravated and non-dust aggravated urticaria and between men and women. Positivity among different allergen groups were as follows: insects-86%, pollen-72%, fungi-72% and 42% in the wool, danger and feather group. Among the insects group all individual allergens had high positivity rates, the maximum being for housefly (housefly – 66%; mosquito – 64%; male cockroach – 62% ; ants – 60%; female cockroach – 52%). Our study showed a high reactivity to aeroallergens in chronic urticaria patients, with the insect group which constitute the major component of house dust being the most common allergen. These findings have to be substantiated by proper controlled studies using larger samples for further validation.

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