PATTERN OF SKIN PRICK ALLERGY TEST RESULTS IN ENUGU

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SUMMARY

Back ground

Allergic rhinitis is a global health problem and is increasing in prebbalence up to 10 – 20% over the last half century. Both allergic rhinitis and vasomotorhinitis are the most common health problems encountered in the Ear Nose and Throat Clinic in Nigeria and they afflict all age groups in any modern society.

Aim

In this study we report on pattern of allergy prick skin test results found among atopic patients attending the department of otorhinolargngology of the University of Nigeria Teaching Hospital Enugu and Hansa Clinics, Enugu and propose ways of minimizing the exposure of the population to allergens.

Material and method

76 patients of which 46 were males and 30 females with signs and symptoms of allergic rhinitis attending the ENT clinics were randomly recruited for the study. The patients' age ranged from ≥ 9 – 48 years with a male to female ratio of 1.5:1. Complete medical, family and social history was obtained. The "Allergo Ganzer" Allergy test kit (Germany) was used for skin prick allergy test on each patient.

Result

The reactivities to test allergens were found to be in 44.4% patients positive to house dust mites I & II, 27.2% to house dust, 22% to grass, 16.6% to cereal and trees respectively and only 8.3% to mould

Conclusion

House dust mites and house dust were the commonest implicated allergens, both accounting for 72.1% of all positive reactivity in our study. The need for avoidance of house rugs and carpets in our homes and offices and the development of local prick test solutions with inclusion of tropical allergens should be emphasized.

Key words

Allergic rhinitis, allergens, , house dust mites, house dust Nigeria.

INTRODUCTION

Allergic rhinitis (AR) is an IgE mediated hypersensitivity reaction of the nasal mucosa of atopic patients to allergens[1]. Previously, AR was classified into seasonal and perennial types. Over the years it was observed that some patients could manifest both seasonally and perennially. The inconsistency experienced with this definition prompted the WHO to develop a new classification method that grouped the disease into severity grades and chronic levels (minimal, moderate, severe).[2] (Table 1). Symptoms of AR include sneezing bouts, watery rhinorrhoea, nasal obstruction and itching eyes. [3, 4, 5,] It is a well documented fact that allergy is a major cause of asthma, perennial rhinitis, classical hay fever and many skin conditions[6]. Epidemiology has greatly contributed in exploring them. [7]Allergen was any substance capable of provoking allergic reaction when the body comes in contact with it. Most of them were high molecular proteins or glycoproteins with a molecular weight of 1 – 10 micrograms. These include food and aeroallergens. An allergic reaction is an alternating response to immune injury with the release of antibodies IgA, IgE, IgI, IgG and IgM. Of these only four are harmful. Allergic Rhinitis is a type IgE hypersensitivity reaction. The offending antibody IgE, reagin, is present in patients in higher serum microgram quantities when compared to normal persons where the IgE is in millimicrogram amounts. IgE adheres to mast cells and combines with it's specific allergens within 5-15 minutes the mast cells discharge several vasoactive peptides; histamines, bradykinin and serotinin. These agents contract smooth muscles and depending on site of contraction, the patient could experience wheezing hives, abdominal pain, nasal obstruction, sneezing bouts and urticaria [8, 9]. Despite considerable research the aetiology of asthma and allergic disease still lacks full understanding. In USA, the sum of $ 2 – 4 billion dollars is spent annually for the treatment of allergic rhinitis [10]. In that population prevalence of disease is 15 – 20%[11], in UK 32.4%,[12,] in Kenya 30 – 25% [13,] in Estonia 11%[14]. Chronic rhinitis caused by vasomotor rhinitis and allergic rhinitis were the most common Ear, Nose and Throat problems in Nigeria with a prevalence of 35 – 39% [6, 15] The head and neck region being the entry point for inhalant and food allergens is equally the region where most allergy induced diseases such as rhinitis, sinusitis, laryngitis, otitis media, allergic conjunctivitis and their complications manifest, [16, 17]. Of all these patients, 10 – 15% was asthmatics [18.] In this paper we examined the pattern of results of allergic skin prick tests conducted in the Ear Nose and Throat departments of the University of Nigeria Teaching Hospital and Hansa Clinics Enugu, Nigeria.

MATERIAL AND METHOD

STUDY DESIGN:

Skin prick allergy test was performed on atopic patients who were randomly recruited from the out-patient clinics of the department of Otorhinolaryngology of the University of Nigeria Teaching Hospital and Otorhinolaryngology Unit of Hansa Clinics Enugu.

EXAMINATION

All the atopic patients presented with sneezing bouts, nasal obstruction and watery rhinorrhoea. Their records on sex, age, precipitating agents, time of the year, family history, profession, living accommodation, significant presenting symptoms and food sensitivities were recordrd. A clinical examination of the ear nose and throat region and a skin prick allergy test were done.

SKIN PRICK ALLERGY TEST

The skin prick tests were carried out by the author using "Allergo Ganzer' Allergy Test Kit (Germany). It comprised of a set of allergen reagents. That kit had 20 solutions

grouped into normal saline, histamin, food, trees, grass, weeds, feathers, hairs and fungus. Intracutaneous in vivo tests were carried out on the right forearm. The right forearm was cleaned with alcohol and marked for each allergen group. Two drops of allergen solution and normal saline were dropped on the circle marked for each one. The skin was pricked using the needle supplied. Results were read after 15 minutes. Any wheal, oedema, erythema or itching > 5mm was considered positive and < 5mm was considered a negative allergen reactivity.

RADIOLOGY

Radiographs of the sinuses of all the patients were obtained in the three conventional views. (occipito – frontal, occipito mental and the lateral view)

EXCLUSION CRITERIA.

Excluded from the study were patients on antiallergics and corticosteroids in the preceding four weeks.

RESULTS

There were 46 males and 30 females with age ranging from 9 – 48 years. Mean age.

The age distribution of the patients is shown in Table 2 as with a peak age incidence 57.8% between 21- 40 years, where the positive reactivity of patients is shown in table 2. 18 patients (23.7%) reacted positively. Most common allergens found were house dust mite (44.4%) and house dust (27.7%) both totaling 72.1%).

The other allergens were grass 22.2% weeds 16.6%, trees 16.6%, fungus 8.3%, hair and feather 0% some patients had multiple reactivity. In this result pollen played a minor role.

The most common radiological findings encountered in this study were sinus opacity in 59 patients (77.6%) and engorged turbinates in 52 patients (68.4%); mucosal thickening was detected in 19 patients (25%). Air-fluid levels and polyps were detected in 10 patients (13.1%) and 8 patients (10.5%) respectively,

Regarding the sinus opacities, the most commonly involved sinuses were the maxillary, 53 patients (69.7) ethmoidal, 18 (23.7%), frontal 7 patients (9.2%). The sphenoid was unaffected in all the patients.(see Table 2). Some patients had multiple lesions or multiple opacities. No mucoceles or orbital complications were radiologically detected in all the patients examined.

TABLE 2: AGE DISTRIBUTION OF PATIENTS TESTED

n = 76

AGE GROUP	NO. OF PTS TESTED	PER CENTAGE (%)
0 – 10	1	2.6
11 – 20	12	15.7
21 – 30	24	31.5
31 – 40	20	26.3
41 – 50	10	13.1
51 – 60	8	10.5

Table 1: Classification of allergic Rhinitis WHO[2].

a. Duration of Symptoms

Intermittent	Persistent
* > 4 days per week	* < 4 days per week
* > 4 weeks	* < 4 weeks

b. Severity of Symptoms

i. **Minimal**
- Minimal symptoms
- Uncompromised quality of Life

ii **Moderate**
- Moderate symptoms
- Moderately Compromised quality of life

iii. **Severe**
- Severe symptoms
- Very compromised quality of life.

TABLE 3 : ANALYSIS OF SKIN TEST POSITIVE PTS
n = 18 = 23.7%

IMPLICATED ALLERGEN	NUMBER WITH POSITIVE REACTION	PERCENTAGE (%)
House dust mite I & II	8	44.4
House dust	5	27.7
Grass	4	22.2
Weed	3	16.6
Tree	3	16.6
Fungus	1	8.3
Animal Feather	0	0

DISCUSSION

Allergic rhinitis is a global health problem with a prevalence rate of about 10 – 20% of the population of industrialised nations and > 30% of underdeveloped countries [15, 19] Risk factors of AR such as genetics, family ethnic group, modification of lifestyle may intervene at all ages in life. Epidemiology has greatly contributed in exploring them. Several national studies in USA have been set in place to improve our knowledge on the subject [20, 21]. Inspite of huge sums of money being spent annually for studies and treatment, data available is still insufficient as regards to it's distribution, aetiological factors and history. Though some local studies have been undertaken by individuals, no national programme on allergy exists in Nigeria[4].

It is reported in N. Europe that seasonal rhinitis is higher in children than in adults and that perennial allergy higher in adults than children[22]. Results of our work and that of Ibekwe et al however revealed that AR is more of a disease of adults than children Table 2 shows that the age grouped of 21 – 30 years had 31.5% allergic rhinitis, while those of 31 – 40 years had 26.3%, 12 – 20 years 15.7% and 0 – 10 years 2.5% positive reactivity. Epidemiological studies in different countries of Europe have shown that the incidence of AR is steadily on the increase [13, 18, 23]. Reports of studies by Charpin D et al 1996 and Davies RJ et al 1998 confirm an increase in the prevalence of allergic rhino conjunctivitis in Switzerland from 0.83% in 1926 to 11.1% in 1991, [23, 24].

Aetiological factors such as industrial smoke, house animals such as (pets and insects cats, dogs, cockroaches), western life style, cigarette fumes, ozon depletion have been implicated, [17], whereas in Europe, Industrial aerogenes and pollen dominate the allergic reactivity, our results in the developing countries (tropics, latin America and East Asia) differ. In a tropical area such as Nigeria, house dust mite, house dust are the most prominent allergens. Our results support that of Ibekwe which showed that indoor allergens had 72.1% and 72.4% positive reactivity respectively while pollen and pet hair played a very minor role, with a test result of 6.3% reactivity. There is usually an increase in domestic allergens in the tropics, East Asia and Latin America. There allergens are derived from house and dust mites. The implicated mite for allergy were *Blomia*

tropicalis. Dermatophasoides pteronyssinus and Dermatophagoides farinae [27]. Other study reports by Haddoc et al 1973 [28] also found a significant excess of D. *farinae*. Warrel et al 1975 in Zaria reported 44%, Mukherjee K et al in Enugu reported 40% positive reactivities to house dust mites and house dust. Different geographical locations have different vegetation's and pollen types. Studies have demonstrated that pollen found in North European Countries were not the same as those found in South European countries such as Italy, Spain and Greece. Patients have reacted differently in these areas to pollen. Patients have reacted positively to trees and plants (Olive trees and bananas) found in their areas of abode, such as Greece and Italy.[30, 31].
Radiologically, sinus opacity, engorged turbinates and mucosal thickening in decreasing order of occurrence accounted for the most common imaging features.
Two previous reports on plain film findings of unspecific rhinosinusitis showed a different pattern. In one of these, engorged turbinates (34.3%) topped the list of radiographic abnormalities. This was followed by mucosal thickening (31.4%) and sinus opacity (21.1%). Air fluid levels and polyps were also much fewer in our present series than in these studies.[32, 33].

Maxillary sinus opacities accounted for the highest number of opacities, this was followed by the ethmoidal and frontal with sparing of the sphenoids.

These opacities are similar in distribution but not in number to those of unspecified Rhinosinusities. Also in this series, (76 patients) no complications such as mucocele or proptosis were encountered. This contrasts significantly with the findings in the series on unspecified Rhinosinusitis in which two such complications were recorded.

There is the need to develop skin test prick specific solutions from grass, weeds, trees and other allergens found in the tropical countries such as Nigeria and other developing countries.

CONCLUSION

House dust mites and house dust were the commonest allergens in Nigeria; both accounting for 72.1% of reactivity in Enugu. Early recognition and good management of allergic rhinitis include allergen avoidance, chemotherapy, immmunotherapy (desensitisation). Allergen reduction in household milieu could be achieved through regular house cleaning. Homes in the tropics should be finished with hard floors instead of rugs and carpets. This atmosphere will offer atopic individuals better quality of life. 7

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