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Study of Triggering Inhaled Allergens in Atopic Patient with Asthma, Allergic Rhinitis, and Allergic Conjunctivitis by Polycheck Technique

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Annotation

The term atopy originates from the Greek world " atopos", which means " out of place", and the disease was first described as " atopic dermatitis" in 1923 by Cooke and Coca to indicate the concomitant occurrence of IgE- mediated hypersensitivity reactions.(1, 2)

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Introduction:

The word atopy refers to an inherited tendency to produce immunoglobulin E (IgE) antibodies in response to small amounts of common environmental proteins such as pollen, house dust mite, and food allergens. The presence of atopy in an individual is associated with an increased risk of developing one or more of the atopic diseases, atopic dermatitis, asthma, and allergic rhino conjunctivitis/ hay fever (and food allergy). However, atopy can be present in the form of asymptomatic sensitization to one or more allergens, which means that an individual with confirmed allergic sensitization does not exhibit clinical allergy. Conversely, an atopic disease can be present in a non- sensitized individual (e.g. in non- atopic asthma). Sensitization is common in the atopic diseases of childhood and less frequent in adults with atopic disease particularly in those with adult-onset atopic disease. (3)

Atopic disease associated with chronic systemic inflammation. (4)

Asthma

Bronchial asthma has been recognized as a significant health condition. Usually considered from a clinical point of view to consist of one or more of the following presented in acute attack: chest tightness, wheezing, shortness of breath and cough. (5)

Asthma is a complex respiratory disease in which genetic predisposition, environmental and immunological influences interfere with each other. It is considered one of the most prevalent chronic diseases, affecting approximately 300 million individuals and causing an estimated 250,000 deaths each year. (6)

Allergic Rhinitis

Allergic Rhinitis is symptomatic disorder of the nose, induced after allergen exposure by an IgE mediated inflammation of the nasal mucosa.(7) Symptoms of rhinitis include rhinorrhea, nasal obstruction, nasal itching and sneezing, reversible spontaneously or under treatment.(8) It is worldwide disease affecting at least 10-25% of the population.(7) In European countries the prevalence has been estimated from 17 to 29%.(9) An increasing prevalence of allergic rhinitis over the last decades has been recognized(10)

Allergic rhinitis is not sever disease but it alters the patient social life, affecting school performance and work productivity. (11) Guidelines for the diagnosis and treatment of allergic rhinitis have already been published (12)

Aeroallergens are very often involved in the allergic rhinitis (13) The prevalence of allergic rhinitis may vary both within and between countries. This variation has been attributed to the overall aeroallergens burden (14)

Allergic conjunctivitis

Allergic disease is common affecting 15% of world population, males are over represented in that number. (15)

Many of these patients also have eye disease seasonal (SAC) and perennial (PAC) allergic conjunctivitis are the most common forms of allergic conjunctivitis, SAC representing approximately half of the cases of ocular allergy. (16) symptoms include itching, burning, watery or sometimes mild mucoid discharge and usually bilateral (17)

Aim of study is to determine the common aero-allergens triggering asthma, allergic Rhinitis and Allergic conjunctivitis in Diyala Governorate by poly check technique.

Materials & Methods

The study was conducted in patient of allergic asthma, allergic Rhinitis and Allergic conjunctivitis in private clinic of Dr. Adnan Hasan Alwan specialist in allergy and clinical immunology.

168 patients are included in this study 101 Female (60.11 %) and 67 Males (39.89 %) table (1)

The patient which are included in this study are 44 patients of asthma (26.1%), 50 patient allergic Rhinitis (29.7%), asthmatic with allergic Rhinitis 53 (31.5%), Allergic conjunctivitis 21(12.5%) table (2)

The study period is from 2/1/2022 to 31/12/2022

For each patient 3 ml of blood was taken, centrifugation was done, 0.5 ml of serum was taken and poly check technique is used in the study (in vitro diagnostic method)

A- All components were tested at room temperature and are mixed well.

B- Reagents lots provided with the actual kit were used only.

C- Powder wash buffer has to be diluted with demineralized water at least 30 minutes prior to use avoid foaming.

D- All incubation steps are performed at room temperature (18- 24 c) and with constant shaking.

E- A flatbed scanner with CCD sensor and scanning resolution of 600 DPI was used for interpretation of the test result.

A sufficient number of poly check allergy cassettes was prepared and mark them only on the long side of the cassette.

The cassettes were moisture with 1 ml wash buffers, by tapping upside- down on absorbent paper.

Overlay allergy cassettes with 250 micro liter of poly check start solution (blue cap) and incubate for 60 seconds (always pipette into the cap). Tap the cassettes carefully upside- down on absorbent paper.

A 200 micro litters of the respective patients serum was add into the cassette and incubate for 60 minutes on a shaker place the MTP- holder on the middle of shaker.

A 3 times was decanted and washed with 1 ml of polycheck wash buffer. Tap the cassettes carefully upside- down on absorbent paper.

A 250 micro liters was adding wash buffer and incubate for 5 minutes on a shaker. Repeat step 5 decant and tap the cassettes carefully.

A 250 micro liter of polycheck anti-IgE antibody was pipeted and incubated for 45 minutes on shaker. Decant and wash 3 times with 1 ml wash buffer. Tap the cassettes carefully on absorbent paper.

A 250 micro liter of polycheck enzyme- labeled anti- ligand was add and incubated for 20 minutes on shaker. Tap the cassettes carefully on absorbent paper.

A 250 micro liter of polycheck substrate solution was added, and incubated for 20 minutes in the dark.

Air drays the membrane and evaluates the polycheck allergy cassettes using scanner and the Biocheck imaging software.

Results

The total number of patients included in study where 168, 101 female and 67 male, their ages were between 2-80 years table (1).

Table 1: age & sex distribution.

Age (years)	Number		Percentage (%)
2-10	Male	10	5.9
	female	26	15.4
11-20	Male	8	4.7
	female	10	5.9
21-30	Male	9	5.3
	female	10	5.9
31-40	Male	11	6.5
	female	19	11.3
41-50	Male	6	3.5
	female	3	1.7
51-60	Male	7	4.1
	female	8	4.7
61-70	Male	9	5.3
	female	11	6.5
71-80	Male	7	4.1

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	Female	14	8.3
Total	168		100.0

In this study the patients complaining of asthma with allergic rhinitis are found 53 patient (31.5%) followed by allergic rhinitis patient 50 (29.7%) then patient with asthma were 44 patient (26.1%) and the last patient were allergic conjunctivitis 21 patient (12.5%) table (2)

Table 2: disease distribution

Disease	**Number**	**Percentage %**
Asthma	44	26.1
Allergic Rhinitis	50	29.7
Asthma with Allergic Rhinitis	53	31.5
allergic conjunctivitis	21	12.5
Total	168	100.0

In this study one cassette of (18 allergen) is used i.e 3024 allergens are used and the results are as the following, the most common allergens triggering these allergic disease is Bermuda grass 27 patient (0.89%) followed by Mits (DPT/ D.Far) which was 21 patient (0.69%) then Cockroach allergen 20 patient (0.66%) the least allergen was Aspergillus Fumigatus, Cage birds 1 patient (0.03%) table (3)

Table 3: distribution of allergen by polycheck technique

Allergen	**number**	**Percentage %**
Bermuda	27	0.89
DPT/ D. Far	21	0.69
Cockroach	20	0.66
Rye pollen	18	0.59
Cat/ Dog epithelium	13	0.42
Grasses	12	0.39
Olive pollen	10	0.33
Plantain	10	0.33
Goose foot	10	0.33
Russian thistle	10	0.33
Mugwort	8	0.26
C. herp& alternaria	7	0.23
Date palm	6	0.19
Blom, trop	6	0.19
Feathers	2	0.06
Candida Albicans	2	0.06
Cage birds	1	0.03
Aspergillus Fumigatus	1	0.03
Total	168	100.0

Discussion

In this study the most common triggering allergens was found in Bermuda grass 0.89% (27) followed by D.pt/ D.far 0.69% (21) then Cockroach 0.66% (20) then Rye grass 0.59% (18) and least one is Aspergellus

Fumigatus and Cage birds 0.03% (1).

In similar study using skin prick test for detection of allergen conducting by Dr. Adnan Hasan Alwan (21) Chenopodacea grass was found as highest allergen triggering the allergic disease and Zeamays grass was found as the least triggering allergens (18).

At another similar study by Ihsan Edan Alsaimay et. al In which they had used polycheck technique, they found that the pooling were the commonest aeroallergens triggering allergic disease in atopic patient (6).

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