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Effect Of Typha Domingensis Plant Antigen On Ige, Cd3, Cd300 Parameter Of Allergic Asthmatic And Bronchial Patients In Basra, Iraq

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ABSTRACT

Background & objectives:A study to determine the effect of plant antigen TYPHA on patients with allergic asthma and bronchitis by estimating the level of immunological parameters IgE, CD23, CD300.

Method: 75 samples were collected from patients with allergic asthma and bronchitis, and 15 samples were collected from healthy people from the Allergy and Asthma Center, their ages ranged between (20-<50). Serum was collected at a rate of 1 cm 3 in 1.5 cm 3 tubes.

Result: Results showed an increase in the number of people, the allergic to antigen of the papyrus plant, as their number reached 49 out of a total of 75 samples, at a rate of (65.3%) , The asthma patients was more sensitive to antigen Typha sp. plant, from patients allergic bronchitis by (49.3%), with a significant difference between them at the probability level ($p < 0.05$). Also results of the study showed that the percentage of females sensitive to the antigen of the Typha sp. plant was higher compared to males and it reached (38.7%), with a significant difference between them at the level of probability ($p < 0.05$As well as , the results of the study showed that first age group (29-20) highest age group sensitive to the antigen Typha sp. plant at rate (21.3%) compared with the other age groups with significant differences between other age groups . Asthe study showed an increase in the concentration of CD23 differential protein among those sensitive to the antigen of the Typha sp. plant at a concentration of 2400 (IU/cm3) and by 36% compared with the non-sensitive with a significant difference between them at the probability level ($p < 0.05$). The current study showed an increase in the differential protein CD300 concentration in those sensitive to the antigen of the Typha sp. plant at concentration 4 (IU/cm3) by 32% compared with the non-sensitive with a significant difference between them at the probability level ($p < 0.05$).

Conclusion: Exposure to Typha sp. plant antigen affects the immune system of asthmatics. So we think this is the reason for the increase in asthma.

Keywords: Typha sp. plant ,antigens,IgE, CD23, CD300.

1.INTRODUCTION

The prevalence of asthma and respiratory allergies among the entire population has increased alarmingly and in high rates all over the world. [1,2]. The rapid rise in the prevalence of these diseases since the 60s is not due to genetic factors alone, as environmental factors increase the risk of developing asthma. [3].The air stream carries various biological particles including pollen, fungal spores, and various pathogens that can harm humans, plants and animals. (4).Rapid urbanization and industrialization have increased air pollution and the population's exposure to many pollutants, and thus most epidemiological studies focus on the potential links between air pollution and respiratory diseases. [5,6].Pollen contains proteins, including glycoproteins, which cause an allergic reaction(7).

Exposure to biological allergens leads to respiratory infections, exacerbation of asthma, respiratory allergies, wheezing, decreased lung function, lower airway inflammation, and upper airway irritation.[8,9,10]It is known that allergens enter the body through the mucosa and activate allergen-specific Th2 cells. Activated Th2 cells produce IL-4 or IL-13, which in turn bind the IL-4 receptor on allergen-specific B cells and stimulate B cells to produce IgE. It has been associated with disorders characterized by chronic inflammation (11,12)The levels of soluble CD23 (s-CD23) and IgE in the serum of patients with allergic rhinitis are significantly correlated. (13)The few studies in allergic patients have suggested an interesting role for CD300 molecules in modulating the activation threshold of basophils, eosinophils, and possibly mast cells, during allergic reactions. (14-15).This study aimed to determine the effect of antigens of the Typha sp. plant on the immune indicators of asthmatic patients.

II. METHODOLOGY OF RESEARCH

Collection Serum samples

75 samples were collected from patients with allergic asthma and bronchitis and 15 samples from healthy people. Samples were collected at a rate of 5 ml in 50 ml tubes.

samples

The serum was collected between 9 am and 12 pm, then the samples were distributed in Abendrov for the purpose of ELISA testing.

Preparation of TYPHA DOMINGENSIS plant antigen

Preparation of Typha sp. proteinextracts was prepared essentially as described by [16]. Determine kiwifruit proteinconcentration according to the protocol Kit (Rockford, IL, U.S.A.) Protein Reagent assay

Estimation Specific IgE (manual ELISA technique):

Evaluation specific IgE for Typha sp. antigen in all sera depend on ELISA assay according to [17] must determine the optimal dilution for reagent, serum and antigen before adding to wells. Each well of ELISA plates will be Coated with 100 µl from 50 µg/ml of the antigens diluted, After coating incubated at 4°Cwashing the plate with diluted (PBS, pH 7) containing (0.05 %) tween 20 immediately. The serum sample was diluted into the following dilution (1,1/2 ,1/4,1/8,1/16,1/32,1/64,1/128, 1/256,1/512),

(100µl) of each was added antigen dilution starting from the second well in the first vertical row. Then cover seal was applied and the plate was incubated at 37 ºC for two hours. The plate was taken out of the 37ºC incubation and washed. The conjugate IgE-HRP diluted two (1/10,1/100 ,1/200,1/400,1/800,1/1600,1/3200, 1/6400,1/12800) and added (100µl) to all wells and incubated one hour at (37 ºC). After that wash the plate four times, added 50 µl substrates (TMB) to each well and incubation at 37 ºC, added (50µl) to stop the reaction and read the plate by an ELISA plate reader at weave 450nmsame ELISA procedure was performed on (75)serum samples. The best concentration-selected of sera (1/32 µl/ml) and conjugate (1/1600 µl/ ml).

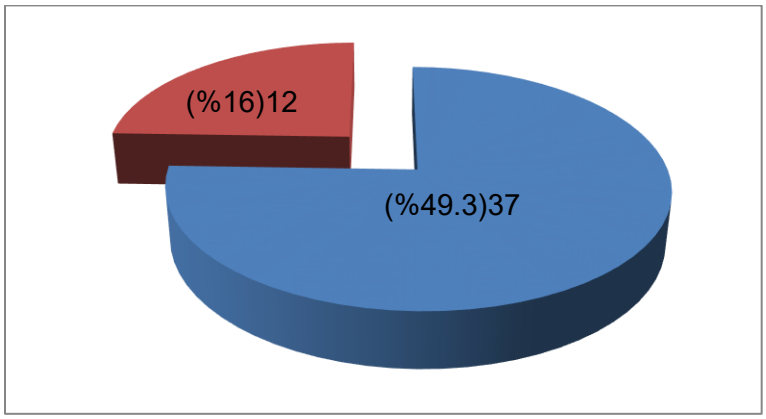
A cut-off value of the IgE titer in the tested samples estimated according to [18], ten serum samples were taken from volunteer individuals who were not exposed to antigens. These samples were considered as negative controls.Cutoff value=X + (2* standard deviation)

Determine IgE,CD23, CD300 Manufacturer steps using an ELISA device manufactured by Jenks Laboratories.(Florida - USA) was used to measure the concentration of each of the following immunological variables for a group of allergic asthmatic and bronchial patients and a group of healthy people (IgE, CD23, CD300).

III. RESULTS

Results showed figure (1) , an increase in the number of people, the allergic to antigen of theTypha sp. plant, as their number reached 49 out of a total of 75 samples, at a rate of (65.3%) , The asthma patients was more sensitive to antigenTypha sp. plant, from patients allergic bronchitis by (49.3%), with a significant difference between them at the probability level ($p < 0.05$). Also results of the study in Table (1) ,showed that the percentage of females sensitive to the antigen of theTypha sp. plant was higher compared to males and it reached (38.7%), with a significant difference between them at the level of probability ($p < 0.05$)..As well as , the results of the study in Table (1) showed that first age group (29-20) highest age group sensitive to the antigen Typha sp. plant at rate (21.3%) compared with the other age groups with significant differences between other age groups . As the study in Table (2) showed an increase in the concentration of CD23 differential protein among those sensitive to the antigen of theTypha sp.plant at a concentration of 2400 (IU/cm3) and by 36% compared with the non-sensitive with a significant difference between them at the probability level ($p < 0.05$). In table (3) the current study showed an increase in the differential protein CD300 concentration in those sensitive to the antigen of theTypha sp. plant at concentration 4 (IU/cm3) by 32% compared with the non-sensitive with a significant difference between them at the probability level ($p < 0.05$).

Figure (1) Distribution of theTypha sp.plant antigen-positive cases by type of disease.



Asthma patients are allergic to sedgebronchitis are allergic to sedge Patients with allergic

Table (1)Results of the ELISA test based on the S. IgE ofTypha sp.antigen, according to Sex and age groups.

	Typha sp.S. IgE		Total
	Positive	Negative	
Sex:			
Male	20	29	49
	40.8%	70.7%	54.4%
Female	29	12	41
	59.2%	29.3%	45.6%
Total	49	41	90
	100.0%	100.0%	100.0%
Age groups			
20-29	17	12	29
	34.7%	29.3%	32.2%
30-39	15	8	23
	30.6%	19.5%	25.6%
40-49	13	9	22
	26.5%	22.0%	24.4%
50 or older	4	12	16
	8.2%	29.3%	17.8%
Total	49	41	90
	100.0%	100.0%	100.0%

Table (2).The relationship of CD23 level among samples sensitive & not sensitive toTypha sp.antigen.

CD 23 level	Allergy toTypha sp.		Total	Sig.
	Positive	Negative		

150	0	10	10	
	0.0%	24.4%	11.1%	
300	0	15	15	
	0.0%	36.6%	16.7%	
600	10	16	26	
	20.4%	39.0%	28.9%	Chi^2= 65.189
1200	12	0	12	P-value= 0.0001
	24.5%	0.0%	13.3%	
2400	27	0	27	
	55.1%	0.0%	30.0%	
Total	49	41	90	
	100.0%	100.0%	100.0%	

Table (3).The relationship of **CD 3000** level among samples sensitive & not sensitive to Typha sp.antigen

concentration/CD 3000	Allergy toTypha sp.		Total	Sig.
	Positive	Negative		
1	0	2	2	
	0.0%	4.9%	2.2%	
2	20	32	52	
	40.8%	78.0%	57.8%	
4	23	7	30	FE Test= 18.450
	46.9%	17.1%	33.3%	P-value= 0.0001
8	6	0	6	
	12.2%	0.0%	6.7%	
Total	49	41	90	
	100.0%	100.0%	100.0%	

IV. DISCUSSION

The current study showed a high number of people allergic to the antigen of theTypha sp.plant antigen, and the percentage of asthmatic patients allergic to this antigen was high compared to patients with allergies to bronchitis, at rate of (49.3%). IgE antibody is a typical biomarker of allergic phenotype, IgE levels are increased in patients sensitive to different antigens and IgE plays a major role in antigen recognition which is responsible for the attack and symptom onset(19). Thus IgE produced upon allergy is a strong risk factor for asthma and has a high diagnostic value for allergens in the blood(20).Study also showed that the percentage of females sensitive to the antigen of the papyrus plant was higher compared to males, reaching a rate of (38.7%). This may be due to the fact that women are more susceptible to depression and psychological stress, as psychological stress affects the risk of

development, and the pathways of many inflammatory chronic diseases, including asthma. Cameron et al. (2020). As well as study showed that the age group (20–29) years is the highest age group sensitive to the antigen of the papyrus plant, and the study did not notice an effect of IgE antibody levels on age. In a study conducted for allergic asthma patients, it was clear that there was no relationship between age groups. and antibody level. (21). The results recorded an increase in the concentration of the differential protein CD23 among those sensitive to the antigen of the papyrus plant at a concentration of 2400 (international units/cm3), at a rate of (36%) compared to the non-allergens. This is due to a relationship with the level of IgE specific to allergens. The study (22) showed high-density expression of CD23 on B cells enhances uptake of allergens and subsequent activation of T cells in allergic patients, which ultimately increase IgE production. As results of the study showed an increase in the concentration of differential protein CD300 among those sensitive to the antigen of the papyrus plant at the concentration 4 (IU/cm3) and by (32%) compared with the non-sensitive ones. CD300 molecules have an interesting role in allergic patients as they modify the threshold for activation of basophils, eosinophils, and possibly mast cells during allergic reactions (23). In their study, (15) showed differences in CD300c expression levels between allergic and non-allergic individuals. Thus, overexpression of CD300c was observed on basophils from children allergic to cow's milk.

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