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Research Article

RESULTS OF MOLECULAR DIAGNOSTICS OF ALLERGENS CAUSING ALLERGY AMONG THE POPULATION OF UZBEKISTAN

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ABSTRACT

Molecular allergological diagnostics is a modern method of determining sensitization, which allows to diagnose specific IgE with higher accuracy than traditional diagnostic methods, especially skin tests. This study was conducted in order to determine the types of allergenic molecules to which patients with allergic diseases are sensitive.

KEYWORDS

Allergic diseases, molecular allergology, diagnostics.

INTRODUCTION

Allergic diseases are an urgent global problem that negatively affects the health of adults and children today. Despite the fact that modern medicine is developing year by year, and new technologies are coming in, there are still many problems that are waiting to be solved in terms of making an accurate diagnosis of allergic diseases in patients. In the history of diagnosis of allergic diseases, in the second half of the 19th century, skin testing with extracts of potential allergenic sources began to be used [1]. In 1967, specific IgE was detected in the blood serum of a patient with myeloma, and tests for in vitro diagnosis of allergic diseases began to appear. It is no exaggeration to say that a real revolution in allergology took place at the

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end of the 20th century, when the first recombinant allergen was cloned [2, 3]. In recent years, molecular allergology methods based on detection of specific IgE have appeared instead of traditional allergen extracts, which are a modern method of determining sensitization. The molecular components used today are purified or recombinant proteins, which provide a higher level of standardization than allergen extracts and allow the detection of specific IgEs with high sensitivity [4]. This study was conducted in order to determine which allergenic molecules are sensitive to allergenic molecules by the molecular diagnostic method.

Material and methods. A prospective observational single-center study was conducted in January-April 2024 at the Republican Scientific Center of Allergology with the participation of 68 patients. The presence of specific IgE in relation to the type of allergen in the patient was determined immunologically using the ISAC (ImmunoCAP) device in the venous blood serum sample. It was analyzed how many patients included in the study were sensitized to each allergen.

Results. According to the results of the immunological analysis, sensitivity to allergenic molecules of plants such as soybean (44%), solyanka (38%), and chenopodium (34%) was the highest among patients. Sensitivity to some allergen molecules (Cannabis - Can s 3, European house mite - Derp 10 and 11, Aspergillus fumigatus molecules, etc.) was not detected in any of the patients.

Material and methods

A prospective observational single-center study was conducted in January-April 2024 at the Republican Scientific Specialized Allergology Center. 68 children and adults suffering from various allergic diseases were included in the study. Clinical and demographic data of patients are given in

Table 1.

Table 1. Clinical and demographic data of patients

Indicator	n	%
Total number of patients	68	100
Sex		
a woman	31	46
male	37	54
Age		

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1-7	18	26
7-18	12	18
>18	38	56
Diagnosis		
Allergic rhinitis	29	42.6
Bronchial asthma	15	22.0
Atopic dermatitis	5	7.35
Bubbles	6	8.82
Drug allergy	2	2.94
Insect allergy	2	2.94
Bronchitis	5	7.35
Others	4	5.88

A detailed allergy anamnesis was collected for the study from patients who applied to the outpatient clinic of the center and received inpatient treatment. Standard clinical and biochemical blood tests were performed. If necessary, examinations such as chest x-ray, determination of external respiratory function were performed.

For the purpose of molecular diagnostics, venous blood was taken from patients, and the presence and amount of specific IgE against the type of allergen in the patient was determined immunologically using the ISAC (ImmunoCAP) device. Using this method, the presence or absence of sensitivity to 294 different allergens from 165 sources was determined. It was analyzed how many patients included in the study were sensitized to each allergen.

Results

According to the results of immunological analysis, sensitivity to allergenic molecules of plants such as soybean, solyanka, and chenopodium was the highest among patients. Table 2 lists the names of allergenic molecules to which sensitivity was determined in more than 10% of patients.

Table 2. Allergens to which sensitization was detected in most patients

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Allergen source	Allergen molecule	Number of encounters in patients	%
Soya	Gly m 5	30	44.1
Solyanka	Sal k	26	38.2
Chenopodium (Common mar)	Ama r	23	33.8
Solyanka	Sal k 1	17	25
Kiwi	Act d 2	16	23.5
Timofeyevka	Phl p 1	15	22.0
Cat	Fel d 1	13	19.1
Date palm	Pho d 2	12	17.6
Timofeyevka	Phl p 2	15	22.0
Ambrosia	Amb a 1	14	20.5
Bees	Api m 1	12	17.6
Perennial weed	Lol p 1	11	16.1
Paspalum/ Buckwheat	Pas n	12	17.6
An ordinary bee	Ves v	11	16.1
Cynodon dactylon	Cyn d 1	10	14.7
Timofeyevka	Phl p12	11	16.1
Cypress	Cup a 1	10	14.7
Erman Shugoh	Art v	11	17.7
Erman Shugoh	Art v 1	11	16.7
Melon	Cuc m 2	11	16.7
Cynodon dactylon	Cyn d	10	14.7
Ambrosia	Amb a	10	14.7
American house dust mite	Der f 2	10	14.7
Japanese cryptomeria	Cry j 1	7	10.2
Stinging nettle	Urt d	8	11.7

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Sensitivity to other allergens has been identified in a relatively small number of patients. Sensitivity to some allergen molecules (Cannabis - Can s 3, European house mite - Derp 10 and 11, Aspergillus fumigatus molecules, etc.) was not detected in any of the patients.

CONCLUSIONS

The use of molecular diagnostics provides additional information about allergens and specifies which plant dusts, food sources of trigger allergens to avoid in patients. Among the population of our republic, sensitivity to Soya - Gly m 5, Solyanka - Sal k, Chenopodium Ama r molecules in patients suffering from allergic diseases is more common than to other allergenic molecules.

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