

# Assessment diagnostic criteria in patients with different clinical and laboratory manifestations of sensitization to house dust mites efficiency and forecasting allergen specific immunotherapy based on allergies component diagnostic

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## SUMMARY

*Assessment diagnostic criteria in patients with different clinical and laboratory manifestations of sensitization to house dust mites efficiency and forecasting allergen specific immunotherapy based on allergies component diagnostic*

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In recent years, marked increase in the number of allergic diseases. Among the common causes of allergic sensitization pathologies allergens are dust mites.

**The aim** of the study was to evaluate the efficiency forecast of allergen specific immunotherapy in 20 patients with sensitization and clinical manifestations of allergy to house dust mites.

**Material and methods.** Verify the diagnosis carried out on the basis of anamnesis, clinical and general laboratory, instrumental studies, the results of skin prick tests (Diater, Spain) ELISA using test kits "Euroimmun" and allergic component diagnostics using immunofluorescence method ImmunoCAP ("Phadia AB", Sweden).

**Results.** Based on studies in 45.0% of defined – absolute mild eosinophilia, in 40.0% – the presence of eosinophils in cytology nasal mucosa, in 65.0% – elevated levels of total serum ige, in 30.0% – parasitic invasion. According prick test and ELISA tests showed 35.0% of people with poly sensitization and all patients exhibited a previous diagnosis. After the diagnosis of allergies component in 80.0% of patients proved true allergic sensitization to various ingredients often – rDer p1, rDer p2.

**Conclusion.** Component allergy diagnostics allowed to verify the final diagnosis and decide on the selection of adequate treatment and to determine the forecast of its performance.

## STRESZCZENIE

*Ocena kryteriów diagnostycznych u pacjentów o różnych klinicznych i laboratoryjnych objawach uczulenia na roztocza kurzu domowego i prognozowanie skuteczności immunoterapii alergenowej w oparciu o diagnostykę komponentową alergii*

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Ostatnimi laty obserwowane jest zwiększenie liczebności chorób alergicznych. Wśród powszechnych przyczyn powstawania patologii alergicznych jest uczulenie na alergeny roztoczy kurzu domowego.

**Celem pracy** było dokonanie oceny prognozy skuteczności immunoterapii alergenowej u 20 pacjentów z uczuleniem i klinicznymi objawami uczulenia na roztocza kurzu domowego.

**Materiał i metody.** Weryfikacja rozpoznania została przeprowadzona w oparciu o badania anamnestyczne, kliniczne, ogólnolaboratoryjne, instrumentalne, wyniki testów skórnych punktowych (Diater, Hiszpania), analizę immunoenzymatyczną ze stosowaniem systemu testowego „Euroimmun” i diagnostykę komponentową alergii za pomocą metody immunofluorescencyjnej ImmunoCAP („Phadia AB”, Szwajcaria).

**Wyniki.** Na podstawie przeprowadzonych badań u 45% osób została stwierdzona eozynofilia bezwzględna o łagodnym stopniu ciężkości, u 40% – obecność eozynofiliów w badaniach cytologicznych jamy śluzowej nosa, u 65% – zwiększenie stężenia całkowitego IgE w surowicy, u 30% – inwazja pasożytów. Wg danych testu punktowego i badań immunoenzymatycznych stwierdzono 35% osób obecność uczulenia na wiele alergenów i wszystkim pacjentom postawiono wstępne rozpoznanie. Po przeprowadzeniu diagnostyki komponentowej alergii u 80% pacjentów potwierdzono uczulenie na różne komponenty alergenowe, najczęściej – rDer p1, rDer p2.

Component definition of sensitizing profile by Consensus of molecular diagnostics and high sensitivity of this method reveals that the true protein is the primary cause allergies and assign causal allergenspecific allergen immunotherapy is the fact, which revealed sensitization. In the treatment of patients is important to use standardized allergens in activity, which controlled for the major components that achieves the highest possible treatment effect.

**Key words:** house dust mites, major and minor allergens, cross-reactivity, allergies component diagnostics, allergen-specific immunotherapy

Allergic disease in recent years impressive humanity in epidemiological scale. Moreover, the problem is not only in the prevalence of allergic pathology, but in a progressive increase in severe cases of allergic reactions, the early onset of the disease, association of allergic diseases with concomitant diseases, declining quality of life for both the patient and his family [23]. In recent decades actively studied mechanisms of immunopathological reactions, developed diagnostic test systems and approaches, including allergic component diagnostic for improvement of allergen-specific causal immunotherapy [15,18].

One of the most common causes and trigger factors in the formation of allergic reactions including asthma are house dust [10]. The composition of house dust is very diverse. It contains particles of human epidermis, hair and flakes of pets, types of mold fungi and others. Important components of the formation of allergy on house dust is house dust mites. At the end of the last century, the Dutch professor *R. Voorhost* proved the existence of a causal link between the insects and the development of allergic diseases in humans [12]. House dust mites are invisible to the naked eye, the size of 0.1-0.5 mm. One gram of dust can contain from 200 to 15.000 mites, and various kinds. Ecological hiding place for them is mostly dark place in areas with high temperature and relative humidity conditions for the presence of food substrate: furniture, carpets, pillows, linens, old clothes and shoes, space savings and storage of clothes, clipped hair in hair salons, public transport etc. [2,22]. Although allergies to dust mites belong to the year-round allergies, in the research conducted at the Institute of Medical Research (Sydney, Australia, 1997-2004) determined that the concentration of mites late autumn may increase by 2-3 times compared with annual levels [9]. This is due to increased humidity (60% or more), including heating and ventilation decrease, creating ideal conditions for their growth and reproduction.

**Wniosek.** Diagnostyka komponentowa alergii pozwoliła na weryfikację końcowego rozpoznania i podjęcie decyzji w sprawie wyboru odpowiedniego leczenia. Komponentowe określenie profilu uczulającego w oparciu o konsensus dotyczący diagnostyki molekularnej alergii i wysoka wrażliwość danej metody pozwala na wykrycie prawdziwego białka, które jest podstawową przyczyną powstania alergii i przepisanie etiotropicznej immunoterapii alergenowej akurat tym alergenem, na który zostało stwierdzone uczulenie. Podczas leczenia pacjentów ważne jest wykorzystanie alergenów standaryzowanych pod względem aktywności, które są kontrolowane pod kątem występowania komponentów głównych, co pozwala na osiągnięcie maksymalnie wysokiej skuteczności leczenia.

**Słowa kluczowe:** roztocza kurzu domowego, alergeny główne i poboczne, reaktywność krzyżowa, diagnostyka komponentowa alergii, alergenowo-swoista immunoterapia

Among the microfauna of house dust mites the leaders of the family are *Pyroglyphidae* – *Dermatophagoides pteronyssinus*, *Dermatophagoides farinae*, and *Euroglyphus maynei*, *Euroglyphus longior*. Their wide geographical distribution is known, some species of mites are found not only in house dust, but also cereals, flour, including *Blomia tropicalis*, etc. [5,17]. Main of mites allergens contained in chitinous cover, and products of their life, called fecal balls (one mite distinguishes them about 15 per day). Increasing the sensitivity of the human body by inhalation occurs when the body components or metabolites enter the airways, and under conditions of mass accumulation – is not included direct contact. The pathogenesis of allergy to mites is usually, IgE-dependent mechanism. Clinical symptoms varied: repeated sneezing, rhinorrhea, watery eyes, itching and redness of the nose (especially the wings of the nose) and eye, skin symptoms, cough, and in severe cases – asthma attacks [14]. Moreover, the growth of mentioned symptoms are usually – at night or before dawn.

Most patients with allergy to house dust mites, given the high cross-reactivity antigenic determinants, at the same time sensitized to *Dermatophagoides pteronyssinus*, *Dermatophagoides farinae*. The degree of sensitization and risk of early debut depends on the concentration of mites indoors (respectively – their allergens), persons age [9]. Determined that the presence at 1gr of dust 100 individuals of mites (2 microgram Der p1) is sufficient to form the sensitization of the child, and the number – 500 species of mites (10 microgram Der p1) is a potential trigger of asthma [3]. Often, when it comes to light or initial manifestation of allergic response to house dust mites sensitization, patients mistakenly associate them with frequent colds bacterial or viral genesis, so do not turn in time to the allergist, so – do not receive adequate causal treatment. There are cases when during of mites allergen sensitization, amplifies an

imbalance in the immune system that can cause not only the formation of allergic pathology, but also autoimmune or immunodeficiency disorders [5, 18].

So the problem of allergies to dust mites is relevant and needs modern approaches to diagnostics and maximize the effectiveness of treatment. Today this problem is solved by the development of component (molecular) diagnostics [11]. Over the past 40 years scientists from different countries isolated from the water-salt extracts and describes significant amount of allergens that are classified by their ability to cause initial sensitivity (major) or explain the cross-reactivity (usually minor) to proteins of similar structure. As for mites *Dermatophagoides pteronyssinus*, *Dermatophagoides farinae*, according Allergen nomenclature 2011, described their 15 molecular components. The most allergenic properties have major components of Der p1, Der f1, Der p2, Der f2 and minor components Der p10 and Der f10 – tropomyosin. Today identify new house dust mites allergen with allergenic properties similar high – Der p23 [4, 7, 13]. However, the current allergen diagnostic panel is not included.

It is known that proteins Der p1, Der f1 cysteine proteases belong to originate from cells of the intestinal canal mites, have high allergenic properties, most of them in the feces mites. Der p1, Der f1 have 80% homology by the presence of cross-reactive epitopes. Allergenic molecules Der p2, Der f2 belong to the family NPC2 (Niemann-Picktype C2 proteins), are the secrets of reproductive mites feed. The degree of homology between Der p2 and Der f2 reaches 88% [11].

Special interest make minor Der p10 proteins and Der f10 – tropomyosin, among which the greatest degree of homology – 98%. Proved that tropomyosin is a part of all cells of the animal world. According to the literature, about 10% of patients sensitized tropomyosin, and the level of sensitization has geographical features (80% – Japan, up 10% – Europe). Studies have shown that the degree of cross-reactivity between mites tropomyosin and other sources reaches 75-80%, it is interesting that the human tropomyosin – 56%. However, the largest cross-reactivity with mites tropomyosin appears seafood, cockroaches and nematodes [16]. As an example, according to the literature, long-term parasitic infestation by mites during sensitization, leads to increased allergic symptoms, severity of symptoms, and – to increase of laboratory parameters (increased levels of eosinophils, total serum IgE, skin prick reaction to tests) [21].

So, definition of individual sensitization profile is important in choosing a treatment strategy for patients with allergic pathology that requires apply the acquired knowledge in molecular allergology in practice physician – allergist at all levels of care.

The aim of the study was to assess the clinical efficiency forecast allergy immunotherapy in patients with sensitization and clinical manifestations of allergy to house dust mites under allergic component diagnostic.

## MATERIAL AND METHODS

We observed 20 patients, 8 (45.5%) male and 12 (54.5%) female, aged 17-43 years. Verify the diagnosis carried out on the basis of clinical disease, anamnesis, including allergic.

Patients held general laboratory and instrumental studies, cytology smears from the mucous nasal cavity, prick tests with extracts of allergens (Diater, Spain) determination of total and specific IgE (sIgE) by ELISA using test kits “Euroimmun” according to the producer instructions. To identify the specific component allergens used immunofluorescence method ImmunoCAP (“Phadia AB”, Sweden). The material of the study was serum.

Obtained results were statistically analyzed.

## RESULTS

At the time of consultation examination patients applied with the following complaints: year-round nasal congestion, which is accompanied by lacrimation, itching, frequent sneezing and coughing periodic (100.0%), rarely – the feeling of shortness of breath (35.0%). In eight patients (40.0%) were complaints of dryness and irritation of the skin with the periodic itching, especially on exposed parts of the arms and legs, in the arms and abdomen. Moreover, skin manifestations of patients do not associate with eating or medicaments, and itchy skin caused most discomfort at night. Eight patients (35.0%) indicated that despite the year-round nasal congestion felt the deterioration in the spring and summer. The above manifestations, most patients shot using antihistamines feeling temporary improvement. Attention is drawn to the fact that 60% of patients indicated improvement while outdoors and conversely – worsening manifestations during temporary change of residence (hotel, rural house, etc.), and 55% – noted the intensification of symptoms in the autumn (October-November). Based on anamnestic data revealed that relatives of three people had similar allergy, but they have not sought the advice of doctors allergists. One patient has burdened allergological anamnesis, asthma verified through the mother, bringing to mind the nature of atopic disease.

The results of the general laboratory studies revealed that in total and biochemical blood tests in most patients deviation from the normal range was not observed, but in nine (45%) patients revealed mild absolute eosinophilia. In smears nasal mucosa in eight

(40%) patients revealed an increased number of eosinophils (from 24% to 72% in sight) and isolated white blood cells, which indicates the allergic nature rhinorrhea, because eosinophils are indirect indicators of allergic reactions. Instead, according to our observations and literature data – if patients allergic manifestations against the backdrop of reduced / normal levels of eosinophils, clinical symptoms then trans-

ferred them usually heavier and faster progress [18]. Patients complaining of periodically shortness of breath evaluated the functional state of lungs under spirometry, the results of which showed no pathological changes. All patients were screened for the presence of worms (ELISA for the presence of immunoglobulin A, M, G to antigens of giardia, roundworm, toxocara ("+"-  $\geq 0,35$ ) + feces on helminth

**Table 1.** The results determine prick tests, total and specific IgE (ELISA), n=20

**Tabela 1.** .....

No	Age	Sex	Prick tests	Helminths	Total IgE KU/L	slg E $\geq 0,35$ KU/L					
						Mixt. mites D.p. D.f.	Timothy	Alternaria	Birch	Cat	Dog
1	32	M	Mixture mites +++ Mixture of herbs +++		314	36,1	56,9				
2	18	F	Mixture mites +	ascaris	215	0,65					
3	30	F	Mixture mites +++	giardia	954	13,9					
4	41	F	Mixture mites +		56	59,2					
5	24	F	Mixture mites ++		89	64,5					
6	22	M	Mixture mites +++		652	30,1					
7	17	F	Mixture mites + Mixture of herbs ++++		108	1,08	38,2				
8	17	F	Mixture mites ++		98	0,93					
9	20	F	Mixture mites ++++ Mixture of herbs ++		1265	>100	12,4				
10	43	M	Mixture mites ++++	ascaris	412	>100					
11	25	F	Mixture mites ++		2	14,08					
12	18	M	Mixture mites + Mixture of herbs ++ The mixture of pollen spring tree +++		316	7,1	13,5		73,2		
13	37	M	Mixture mites ++		65	2,6					
14	40	F	Mixture mites	giardia + ascaris	957	21,3					
15	22	F	Mixture mites + Mixture of herbs ++++ The mixture of pollen spring tree ++	ascaris	453	1,2		36,6	1,54		
16	25	F	Mixture mites ++		7	12,5					
17	29	M	Mixture mites ++ Mixture of herbs +++ The mixture of pollen spring tree ++ Cat+ Dog+		265	21,1	19,7		11,7	1,3	1,01
18	33	F	Mixture mites +++	giardia	211	17,3					
19	19	F	Mixture mites ++ Mixture of herbs + The mixture of pollen spring tree ++++ Cat++ Dog++		201	9,2	0,92		31,8	8,3	4,0
20	36	F	Mixture mites ++		64	57,1					

eggs and protozoa), which resulted in three people verified – ascariasis, two people – giardiasis, one person – ascariasis + giardiasis). The present patients recommended appropriate treatment.

According to the Consensus of molecular allergy diagnostic (A WAO-ARIA-GA2LEN consensus document on molecular-based allergy diagnostics, 2013), received the first stage of studies medical history that indicated the presence of all patients allergic violations, we proceeded to the second stage of diagnostic tests [6].

For this purpose all patients was held prick testing with extracts of household and epidermal allergens "Mixture mites (*Dematofagoides farinae* and *Dematofagoides pterinissinus*)". Additionally, patients with exacerbations in the spring and summer made prick test allergens "Dry grasses (timothy, ryegrass, *Dactylis glomerata*)" and "The mixture of pollen spring trees (alder, birch, hazelash). The results of the second phase of examination are presented in Table 1.

Analysis of the results of skin tests showed that all patients was raised cutaneous reaction to household allergens, including – "Mixtures of house dust mites". Thus, the skin reaction was different from "+" to "++++", indicating different degrees of sensitization to mites. In addition, seven (35%) of patients on the background of positive results for household allergens found: three people – a positive reaction to the "Mixture of herbs", two people – the "Mixture of herbs" and the "Mixture of pollen spring tree" in the other two – the "Mixture of herbs", "Mixture of pollen spring tree" and cat and dog allergens, which indicated the formation of their sensitization and amounted difficulties for selecting treatment.

The next stage of research was to determine total and specific IgE-antibodies by ELISA, results are also shown in Table 1.

According to the research revealed that 13 (65%) patients serum total IgE exceeded normal levels and was in the range of 108-1265 IU/ml. Seven (35%) patients were indicators of total IgE in the normal range (100 IU/ml), but drew attention to the fact that two people its level was relatively low, namely 2 IU/ml and 7 IU/ml. This suggests the probability of the presence in these patients immunodeficiency disorders associated with the synthesis of IL4, IL13, which are responsible for the production of IgE, or immunoglobulin concentrations present in the area of direct damage [19].

The study of specific IgE (ELISA) in all patients revealed sensitization to house dust mites (> 0,35 kU/l), and in two (10%) people – with sIgE levels >100 kU/l, the rest – from 0,65 kU/l to 64,5 kU/l. In patients with monosensitization to house dust mites on the basis of the first stages of diagnosis (prick tests, ELI-

SA) diagnosis doubt not. Consequently, we had raised a preliminary diagnosis – chronic allergic rhinosinusitis (chronic allergic dermatitis – subject to the availability of cutaneous manifestations), sensitization to house dust mites.

However, seven patients with probable sensitization (based prick tests) determined: three persons – against sIgE (36,1 kU/l, 1,08 kU/l, >100 kU/l respectively) to a mixture of mites – sIgE to timothy (56,9 kU/l, 38,2 kU/l, 12,4 kU/l respectively); two people – against sIgE (7,1 kU/l, 1,2 kU/l respectively) to a mixture of mites – sIgE to timothy (13,5 kU/l), *alternarij alternativ* (36,6 kU/l) respectively and warty birch (73,2 kU/l, 1,54 kU/l, respectively); the other two people on the background of sIgE (21,1 kU/l, 9,2 kU/l respectively) to a mixture of mites – sIgE to timothy (19,7 kU/l, 0,92 kU/l, respectively), warty birch (11,7 kU/l, 31,8 kU/l respectively), cat epidermis (1,34 kU/l, 8,3 kU/l respectively) and dogs (1,01 kU/l, 4,0 kU/l respectively). These results confirmed the presence in these patients polysensitization, which created difficulties for the proper purpose specific allergen-specific immunotherapy.

The low value of the amount of specific IgE to house dust mites in patients with ascariasis also raised doubts about the presence of their true sensitization to mites or cross-reactions to tropomyosin, which, as noted above, is also part of ascarides cells.

According to the Consensus of molecular allergy diagnostic these patients was necessary to the third phase of research – component diagnostics. One of the major features of this method is to identify both primary species-specific allergens and cross-reactivity markers. In the presence of the patient's sensitization only to the primary species-specific (major) allergens effect of allergen-specific immunotherapy is 85-90%. At the same time, identify significant titles to minor allergen sIgE against the background of the main allergen sensitization is predictive no effect of allergen-specific immunotherapy [1,8,13].

Therefore, for the detection of true sensitization proteins, choosing the right tactic treatment and prognosis efficiency of allergen-specific immunotherapy we offered to all patients spend allergy component immunofluorescence analysis – ImmunoCAP, the results of which are shown in Table 2.

According to the results of molecular studies, patients were divided into four groups:

1<sup>st</sup> group: Four patients (No 3, 4, 6, 11) of sensitization only major allergens from house dust mites *Dermatofagoides pteronyssinus* (rDer p1, rDer p2, from 13,13 kU/l to 59,2 kU/l). Note that the study was performed with recombinant allergens (rDer p1, rDer p2) to *Dermatofagoides pteronyssinus*, which, as noted above, have high sensitivity to homologous

**Table 2.** Results allergies component studies (ImmunoCAP, sIgE  $\geq 0.35$  KU/l), n=20

No	rDer p1, rDer p2	rDer p10	rPhl p1, rPhl p5	rPhl p7, rPhl p12	Alt a 1	rBet v 1	rBet v 2, rBet v 4	rFel d 1	rCan f 1	Recommended
	maj	min	maj	min	maj	maj	min	maj	maj	
1	30,2	–	41,7	–	–	–	–	–	–	SLIT Timothy → mite, eff. high
2	–	0,5	–	–	–					SLIT(–), anthelmintics therapy
3	10,3	–	–	–	–					SLIT mite, eff. high
4	57,5	–	–	–	–					SLIT mite, eff. high
5	60,3	2,35	–	–	–					SLIT mite, eff. average
6	30	–	–	–	–					SLIT mite, eff. high
7	–	–	37	8,3	–					SLIT mixture herb–eff. average
8	–	1,24	–	–	–					SLIT (–)
9	97,8	2,35	–	5,4	–					SLIT mite, eff. average
10	>100	11,37	–	–	–					SLIT mite, eff. average
11	16,11	–	–	–	–					SLIT mite, eff. high
12	5,08	3,03	13,3	0,54		71,5	50,12			SLIT spring tree–mite, eff. average
13	–	1,54	–	–	–					SLIT (–)
14	18,3	14,08	–	–	–	–				SLIT mite, eff. average
15	–	1	–	–	35,4	0,74	–	–		SLIT altern, eff. average
16	11,5	9,3	–	–	–	–	–	–		SLIT mite, eff. average
17	19,7	3,4	20,1	11,2		12,5	10	5,4	0,55	SLIT mixture herb–eff. average
18		5,4								SLIT (–)
19	10,38	1,24		0,72	–	45,4	–	1,2	–	SLIT spring tree–mite, eff. average
20	–	50,3	–	–						SLIT (–)

molecules *Dermatophagoides farinae* Der f1, Der f2 [15, 20]. Based on this molecular studies in patients diagnosed "Chronic allergic rhinosinusitis, sensitization to house dust mites rDer p1, rDer p2". Therefore, they recommended conducting sublingual allergen specific immunotherapy (SLIT) "Dust mites mixture (Diater, Spain)", and the forecast of its high efficiency.

2<sup>nd</sup> group: Four patients (No 5, 10, 14, 16) with the major allergen sensitization to mites rDer p1, rDer p2 (from 11,5 kU/l to > 100 kU/l) against the backdrop of a minor allergen detection rDer p10 (from 2,35 kU/l to 14,8 kU/l) – tropomyosin – marker of cross-reacti-

vity. The present patients diagnosed with – "Chronic allergic rhinosinusitis, major allergen sensitization to house dust mites rDer p1, rDer p2 and minor allergen rDer p10". Based on these data, the second group of patients is recommended SLIT spray "Dust mites mixture (Diater, Spain)". Forecast efficiency of treatment is a medium-terms of the elimination diet products except crustaceans, hygiene recommendations for living conditions and periodic monitoring of parasitic infestation.

3<sup>rd</sup> group: five patients (No 2, 8, 13, 18, 20) with sensitization to only minor allergen rDer p10 (from 0,5 kU/l to 50,3 kU/l). The diagnosis in these pa-

tients – "Chronic allergic rhinosinusitis, major allergen sensitization to house dust mites rDer p10". Based on data allergies component diagnostics to patients of the third group holding SLIT is not recommended, as the effect of it will be low. Instead, patients are recommended a diet with the exception of crustaceans food, hygiene facilities, if possible – avoiding places with high concentration of house dust mites, periodic monitoring of parasitic infestations. As an example, patients No 2 and No 18 after successful treatment ascaridosis/giardiasis clinical symptoms disappeared, and prick tests repeated after 3 months were negative. Most such cases serve as examples of diagnostic errors in practicing allergists. When patients only by the first stage of research, based on a preliminary diagnosis correctly assigned allergen specific immunotherapy, which serves only to sensitization of the organism and enhances clinical manifestations.

4<sup>th</sup> group of seven persons (No 1, 7, 9, 12, 15, 17, 19) of poly sensitization. Note that on a history precisely in these patients experienced exacerbation of clinical manifestations of allergies in the spring and summer.

The present patient was also verified the final diagnosis (in most cases – hay fever) and recommended a phased SLIT. Selecting mixture for starting treatment depended on the prevailing concentration and true allergen season. Given the presence of minor allergens – forecast expected average efficiency.

## DISCUSSION

However, we want to focus on the results of the study patient No 7, which proved a shining example need for molecular studies in patients with polysensitization. In the person on a background of positive prick tests to a mixture of mites and mites to the presence of sIgE in ELISA studies – the method of molecular diagnostics presence of allergenic molecules of this type are not confirmed. This indicates a lack of sensitivity (specificity) of the first two studies compared with ImmunoCAP immunofluorescence method and emphasizes the need to enforce molecular diagnostic methods – especially under the conditions present in patients poly sensitization. This patient is recommended to spray SLIT "Mixture of meadow grasses" average forecast of its performance.

Thus, having considered clinical examples of different variants of sensitization to house dust mites, we have shown the need for staged diagnosis in patients with allergic pathology by Consensus of molecular diagnostics, where the basis of anamnesis, results of prick tests and ELISA studies of patients

exposed preliminary diagnosis. A decision on the correct choice of treatment strategy and forecast its effectiveness necessary to satisfy the allergic component research. Determination of the individual patient's sensitization profile is of fundamental clinical importance not only in patients with poly sensitization, but also in those with monosensitization in the first place – for the diagnosis of possible cross-reactions.

## CONCLUSIONS

1. Among patients with sensitization to house dust mites defined absolute eosinophilia in 45%, elevated levels of eosinophils in the nasal mucus cytology cavity in 40%, increased levels of total serum IgE in 65%.
2. In 30% of patients had a parasitic infestation that required treatment because the cause cross-reactivity as a result – a diagnostic error conditions for the sensitization of the organism mites.
3. Based prick tests and ELISA studies poly sensitization found in 35%. Patients with detected only major allergens house dust mites rDer p1, rDer p2 recommended spray SLIT "A mixture of dust mites" Efficiency of sublingual immunotherapy conducting is high.
4. Patients defined only minor mites allergen rDer p10 – tropomyosin holding SLIT is not recommended because of its effectiveness will be low. Patients are recommended a diet with the exception of crustaceans food, hygiene facilities, if possible – avoiding places with high concentration of house dust mites, periodic monitoring of parasitic infestations.
5. Patients diagnosed major allergens from house dust mites rDer p1, rDer p2 against the backdrop of minor allergens rDer p10 recommended SLIT "Dust mites mixture" and relevant elimination (diet) and hygiene guidelines. Efficiency of sublingual immunotherapy conducting is average.
6. Patients with poly sensitization was necessary requirement for component allergy diagnostic for the correct choice of treatment, correction therapy for stage monitoring of the patient and assess its effectiveness.
7. Component definition of sensitizing profile by Consensus of molecular diagnostics and high sensitivity of this method reveals that the true protein is the primary cause allergies and assign causal allergenspecific allergen immunotherapy is the fact, which revealed sensitization.
8. In the treatment of patients is important to use standardized allergens in activity, which controlled for the major components that achieves the highest possible treatment effect.

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**Conflicts of interest**

All authors declare that they have no conflicts of interest in relation to this study.

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