DIET THERAPY IN NUTRITIONAL ALLERGY

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ABSTRACT

Allergies are among the most common diseases affecting economic performance. Significantly, these diseases often affect children, adolescents and young people who must actively study or work. The question of the dynamics and profile of IgE-mediated sensitization to various allergens is extremely important. The main factors determining the possibility of developing sensitization are the presence of exposure and the properties (biochemical and physical) of a particular allergen. Global climate changes were reflected in changes in the physicochemical constants, which determine the existence of biological systems, and influenced the amount of pollen and fungi. In recent years, the range of plant products included in the diet has dramatically expanded. The use of new technologies in the food industry has radically changed the generally accepted understanding of a particular product's composition. It is important to identify the causative allergenic product in order to prescribe optimal dietary therapy.

Key words: allergic diseases, food allergy, fungi, diet therapy

I. INTRODUCTION

Allergies are among the most common diseases affecting economic performance. Significantly, these diseases often affect children, adolescents and young people who must actively study or work [6]. The increase in the number of allergic diseases is due to the lack of early reliable diagnostic methods and the insufficient effectiveness of the existing therapy methods [8]. Food allergy occupies a special place among allergic pathology. The course and development of food allergy are influenced by many factors, including the genetically determined predisposition of the body, the influence of environmental factors, excessive exposure to antigens on the intestines, the immunomodulatory effect of viral infections and various diseases that increase the permeability of the intestinal wall for undigested proteins and other components of food substrates [12].

The question of the dynamics and profile of IgE-mediated sensitization to various allergens is extremely important. The main factors determining the possibility of developing sensitization are the presence of exposure and the properties (biochemical and physical) of a particular allergen. Global climate changes were reflected in changes in the physicochemical constants, which determine the existence of biological systems, influenced the amount of pollen, its allergenicity, and the duration of the dusting season. In recent years, the range of plant products included in the diet has dramatically expanded. The use of new technologies in the food industry has radically changed the generally accepted understanding of a particular product's composition. Animal products may contain plant allergens (sausages may contain soy proteins, tree nuts, spices) [5]. There cannot be a single "standard" elimination diet for all patients. Recommendations, first of all, should take into account individual hypersensitivity to food. Very often, unjustified exclusion of a large number of food products negatively affects the mental state of children and adults. The exclusion from a sick young child's diet of some foodstuffs necessary for growth may negatively affect his physical development [7]. It is important to identify the causative allergenic product in order to prescribe optimal dietary therapy. Recent studies have demonstrated that sensitization to the same product in residents of different countries does not have identical clinical manifestations [14].
**Purpose of the study.** Diet therapy for patients with food allergies, taking into account the allergenic properties of local food in hot climates.

II. MATERIAL AND METHODS

We have introduced into clinical practice modified immunoblot panels of allergens RIDA qLine Allergy (Germany) for In vitro allergy diagnostics. Each panel contains five standards calibrated according to the international reference protocols “1st WHO IRP 67/86 for human IgE” and 20 allergens. This test allows you to quantitatively measure the concentration of allergen-specific IgE (IU / ml) in the blood serum by the method of immune analysis. The results are also expressed in RAST-classes. The conditional norm of concentration of allergen-specific IgE is up to 0.35 IU / ml, and this concentration is identical to 1 RAST class.

III. RESULTS AND DISCUSSION

After a detailed history of the disease, IgE antibodies were identified in patients with allergic diseases at the age of 14-70 years (n = 26) in order to choose an appropriate diet. Sensitization above 1 RAST was noted (food panel) for tomato (61.54%), honey (57.69%), strawberry (46.15%), peach, orange, wheat flour (41.7%), walnut, sunflower seeds, peas (38.46%), apricot, watermelon (34.61%), peanuts (30.77%), cow's milk (11.54%), egg white (7.69%), egg yolk, chicken meat (3.85); lemon, celery (48%), grapefruit (28%), fish mix (8%), cheeses (4%), gluten (23.53%), cow's milk (17.64%), egg, yoghurt (11, 76%), banana, soy protein (5.88%). Latent sensitization to latex was revealed in 20.83% of patients. It should be noted that latex sensitization was accompanied by a cross-reaction to Dermatophagoides pteronyssinus (latex mite syndrome), moulds Mucor mucedo and Rhizopus nigricans (latex mushroom syndrome), nuts (peanuts, hazelnuts, Brazil nuts, almonds, coconut), pollen of plants ragweed, plantain, wormwood, birch (latex-pollen syndrome) in 83.3% of patients. Sensitization to the epithelium of animals (cat, dog, horse, cow) was noted in 33.3% of patients with latex allergy.

All patients with hay fever with a combined food allergy showed an exacerbation of the disease during the flowering season of causally significant plants to develop more pronounced clinical symptoms. Among the most common allergens are fruits of the Rosaceae family: apples, pears, peaches, apricots, strawberries. Sensitization to apples in many patients is combined with an allergy to birch pollen due to the similarity of their allergens, symptoms of damage to the oral cavity and pharynx are mainly expressed, sometimes allergic rhinitis, bronchial asthma, and gastrointestinal disorders occur. Peaches often cause both the manifestation of allergies in the oral cavity and systemic reactions: urticaria, asthma and even anaphylactic shock. Strawberries cause gastrointestinal disorders, oral allergy syndrome, atopic dermatitis, bronchial asthma, and allergic rhinitis.

Vegetables and fruits play an important role in the development of food allergies in older children and adults. The main antigens, in this case, are certain proteins of fruits, vegetables and nuts, an allergic reaction to which is often caused by preliminary sensitization to the pollen of some plants. Patients with allergies to these products are most often concerned about itching, tingling, burning sensation of the mucous membranes of the cheeks, gums, upper palate and lips. It is important to note that allergic reactions often occur in response to eating fresh vegetables and fruits; heat treatment or canning removes their allergenic properties. Food antigens contain epitopes present in profilin structure and are common with the epitopes of some types of pollen (trees, grasses, cereals). Therefore, allergic reactions occur to fruits and vegetables, although they may appear whenever they are consumed much heavier in the corresponding plants' flowering season.

It should be noted that allergic reactions can occur as an immune response to allergens from house dust mites, pets, pollen, and fungal spores. Only about 100 species of fungi possess allergenic properties out of more than 100,000 species of known fungi. Because fungi can colonize substrates almost everywhere, their spores are constantly present in the air, causing year-round symptoms in sensitized patients. Among the fungi with etiological significance in the development of allergies, representatives of the genus *Aspergillus* are among the most important inhalation allergens in various countries.

Moulds play a significant role in the development of allergic sensitization in the body. Under the action of the antigenic structures of fungi, various pathological processes are formed in the immune system, including type I allergic reactions caused by IgE mechanisms, as well as other types of allergic reactions [1, 4]. Constant contact with the fungus leads to colonization in the respiratory tract and can cause persistent allergenic stimulation [3].
Rhizopus survives in very humid conditions and is susceptible to low humidity. Rhizopus spp usually forms black mould on bread. Moreover, fungi of the genus Cladosporium also survive in relatively humid conditions and are especially sensitive to lack of moisture. The origin of fungi is dead plants, cheeses, cereals, textiles, old window frames [11, 13].

In the treatment of food allergies, diet therapy methods are used in practice. After identifying sensitivity to various foods, fungal and occupational allergens, we used the elimination diet method in our study.

Depending on the ability to maintain antigenic properties during proteolysis and heat treatment, two classes of food allergens are distinguished. Class I - heat stable proteins, resistant to digestion and heat treatment. Sensitization to them develops in the gastrointestinal tract. Therefore, they are most often characterized by generalized clinical manifestations. This class includes allergens of milk, eggs, fish, peanuts and plant products containing lipid-transferring proteins [2, 9, 10]. Class II food allergens are thermolabile proteins typical of fruits and vegetables, but they can also be found in animal products. Sensitization to them is formed indirectly due to the patient's previous allergization with homologous plant proteins through the respiratory tract. The characteristics of food allergens include the ability to change antigenic properties during the cooking process of food. When heated, some foods lose their allergenicity, while others, on the contrary, become more allergenic. Allergies to peanuts and other legumes (soybeans, beans) and tree nuts often begin in childhood and persist for a long time, even into adulthood.

IV. CONCLUSION

The frequent presence of polyvalent sensitization, the rare presence of allergies to one food product, the formation of cross-allergic reactions, the frequent presence of hidden allergies in finished food products are the main difficulties in selecting an elimination diet. In misdiagnosed food allergies, unnecessary food exclusion leads to a lack of essential nutrients, especially in children and adolescents. Timely diagnosis - knowledge of the characteristics of food allergens depending on thermal stability and an individual approach to selecting an elimination diet prevents complications of food allergies.

Conflict of interests and contribution of authors

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