MYCOGENIC SENSITIZATION AND ITS PREVENTION

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Abstract . The scientific article is devoted to the study of the prevalence of sensitization to food and fungi, as well as its prevention in a hot climate. To date, fungi are known in different countries of the world as an etiological factor of allergic diseases, in patients with allergic diseases, based on a detailed medical history and with the help of modern in vitro diagnostics, it is possible to detect sensitivity to fungal allergens. In hot climates, the detection of immunoglobulin E antibodies to mold and yeast fungi such as Aspergillus, Penicillium , Cladosporium , Alternaria and Rhizopus and only with the help of a personalized approach to diagnosis and therapy can be achieved.

Key words : food, fungal allergens, allergen -specific immunoglobulins E, atopy, environmental factors.

The urgency of the problem. Allergic diseases are found in different age groups of the population all over the world, and the increase in the incidence rates can be caused by the increased sensitivity of patients to fungi. The analysis of literature sources showed that sensitivity to fungi among different types of allergic diseases has a wide fluctuation (from 2% to 60%), but often sensitivity to fungi can be overlooked by doctors [11].

Sensitivity to fungi often manifests itself in the form of rapid-type allergic reactions with immunoglobulin E (IgE)-related mechanisms. Patients sometimes develop II, III and IV allergic diseases [13]. Allergic reactions to house dust mites, pet allergens, and foods can also be observed in patients with sensitivity to fungi due to changes in the immune system. One of the unique characteristics of fungal allergens is that they can be present indoors and outdoors at different times of the year, so patients experience disease symptoms throughout the year [14].

Currently, mold fungi are considered important in the development of allergic sensitivity in the body, they can cause IgE-related allergic reactions [5, 9]. fungus with constant communication as a result breath on the roads to colonization take will come and disease symptoms calls [7].

Fungal allergens are part of outdoor bioaerosols and can cause allergic rhinitis, conjunctivitis, bronchial asthma and allergic bronchopulmonary mycosis. In this case, mold fungi have a significant effect on the immune system of patients compared to plant dust or other household allergens [12].

Fungi belonging to the genus Aspergillus are one of the most important inhalation allergens in different countries of the world, with a prevalence of 15.3-38%. Among the allergenic components of this fungus: Asp n 14 (β -xylosidase) is an occupational allergen used in the production of bread, which can cause sensitivity symptoms in about 4% of bakers. Asp n 18

(vacuolar serine protease) protein and its homologs have been identified in Aspergillus fumigatus (Asp f 18) and Penicillium (Pen ch 18 and Pen o 18). Asp n 25 (3-phytase B) is a glycoprotein with a molecular weight of 85 kDa, which is often used as an enzyme additive in the processing of phytate-rich food products, such as grains, legumes, and is recommended as a beneficial food additive and phytate-rich products. helps in good digestion [2, 14, 15, 16].

As a result of prolonged contact with fungal spores, immune reactions can occur, leading to the formation of IgG and IgA [10]. Mycogenic allergy is often accompanied by polyvalent sensitization. According to observations, fungal allergens are the causative allergens in 20–65% of people suffering from allergic diseases, and bronchial asthma is observed in 20–25% of them [3]. In about 3-6% of cases, the development of bronchial asthma can be caused by fungal spores. The high amount of fungal spores is inextricably linked with the sanitary-epidemiological characteristics of human living conditions, geographical region, environmental factors, and season. The penetration of fungal spores into the human respiratory tract depends on their size, and the smaller they are, the deeper they penetrate into the respiratory tract (often their size is from 1 to 40 μm) [3, 10].

The researchers stated that 76.5% of the houses had high concentrations of fungal spores, which were observed to be higher than the conditionally allowed amount (500KOE/m ^{3}). Among all detected fungi, Penicillium spp., Aspergullus spp., Cladosporium spp. and Rhizopus spp. A high concentration of A high degree of correlation was observed between the specific IgE against fungal allergens in the blood serum of the owners of these households and the spores of micromycetes in the indoor air. Mold fungi of the genera Rhizopus and Cladosporium have been found to be one of the most common components in house dust [6, 10].

It is known that Rhizopus fungus lives in humid conditions and is considered dangerous because it usually spreads in the form of black fungus when bread products are not stored properly. Fungi of the genus Cladosporium also live in relatively humid conditions and are considered very sensitive to lack of moisture. Fungi are known to be stored in cheese, grains, cereal products, and plants [14].

Practitioners can make assumptions about a positive mycotic history with the help of a complete and carefully collected anamnesis. We recommend paying attention to the following points:

1. Presence of communication with household mold. Most patients are unaware that their symptoms are related to their living or working conditions. They do not even think to tell the doctor that the symptoms of the disease appeared after changing the home or work environment. Sometimes, after taking a complete anamnesis, the doctor has to find the "guilty" allergen himself. Because microscopic-sized, unnoticeable fungi affect the course of bronchial-pulmonary diseases in sensitive patients in living rooms. In this case, climatic conditions, geographical region have a certain influence on the composition of micromycetes and biochemical processes. Conidia of some fungi (Alternaria alternata, Mucor spr., Penicillinum spr., Aspergillus spr.) penetrate through the respiratory tract and cause allergic reactions, mycoses of internal organs (Aspergillus flavus, Asp. fumigatus, Asp. niger), mycotoxicoses (Alternaria alternata, Aspergillus flavus, Asp. fumigatus) [4, 6].

It should be said that the growth and development of fungi in the room directly depends on humidity and temperature, and they are flower pots, food storage areas, products stored in improper conditions (bread, vegetables and fruits), shower rooms, old furniture, trash cans,

organic grows on substrates (wool fabric). Compared to concrete houses, wooden houses are more likely to encounter high humidity conditions. Aspergillus fumigatus fungi have also been found in pillows. Fungi of the genus Penicillium can be found even in the foundation of the house [11].

Cladosporum herbarum is widely distributed in the outdoor environment and is considered a major source of inhaled fungal allergens. Cladosporum herbarum can also be found in decaying grass and tree branches, as well as in textiles and food products. Cladosporum herbarum is also found on plant leaves under favorable conditions in temperate climates, and its allergenic proteins can cause life-threatening bronchial asthma attacks and respiratory symptoms in the upper respiratory tract [14].

Spores of some fungi such as Alternaria, Aspergilla, Penicilla and Cladosporium are volatile, and they are widely distributed in different countries of the world. Alternaria alternata is often kept on plants and belongs to the genus of allergenic fungi. Apical spores-conidia develop in the segmented mycelium of brown color, which can form individually or in chains. Immature fungal spores can be distinguished by shape, size, color, number of cells, and cell wall thickness. Alternaria alternata is stored in the soil, rotten wood, corn, various plants, food products, textiles, and can cause dark spots on vegetables, fruits, and nuts. Alternaria alternata has been observed to cause allergic rhinitis and asthma in susceptible individuals when kept in living rooms, such as in air conditioning [14].

In our practice, it was observed that Alternaria alternata caused symptoms of bronchial asthma in a 13-year-old boy living in this room due to constant damp conditions in the house. When the home conditions improved and the child began to live in another room, the indicated treatment measures began to show positive results [1].

Alternaria are observed in the air of some cities all year round, and their concentration peaks in spring, summer, and autumn. A number of meteorological factors, including air temperature and atmospheric pressure, have a correlation with Alternaria spore concentrations [14]. Alternaria is considered the main cause of illness in children, in temperate climate, Alternaria spores are detected from May to November, and the concentration is highest in summer and autumn. Dispersion of spores is observed during the dry season at high wind speed and low humidity, at midday when the sun is high. Despite the large size of the spores, they can fly long distances, which means that on dry, windy days, in areas of grain and wild grasses, Alternaria spores can be dispersed from 500 to 1000 per cubic meter of air. Up to 7,500 spores per 1 cubic meter in open air, and up to 280 spores per 1 cubic meter of room air were observed [14, 16].

2. Professional communication with fungus. Fungi are widespread, and they are widely used in the food industry, livestock, poultry, flour, cheese, beer, wine production, agriculture, horticulture, pharmaceuticals, yeast, enzyme preparations. As a result of the development of sensitivity to fungi in patients with allergic diseases, sensitivity to fungi can occur in the form of suffocation or disease attacks after being in damp rooms, basements, vegetable and fruit warehouses, archives, swimming pools, subway stations [8].

3 . The presence of atopy. In adult patients and children, the presence of atopy or "atopic march" in offspring, this condition is characterized by the rapid type of allergic reactions related to immunoglobulin E.

4. Seasonality of the disease. In patients with diseases of the respiratory system, who often get sick and have a mycotic infection in the anamnesis (sputum culture and nasal smear,

detection of fungi in stool analysis, candidiasis, onychomycoses, dermatophytes, etc.), especially in the autumn-spring months (the period when fungi form spores) condition may worsen. When taking an anamnesis from patients, it is usually necessary to pay attention to their frequent colds, rhinosinusitis, obstructive bronchitis in their anamnesis. Patients who lived on the first floor or in damp conditions are often diagnosed with "asthmatic bronchitis" or "bronchitis with an asthmatic component" in their outpatient cards. In most patients, bronchial asthma occurs after the clinical presentation of recurrent obstructive bronchitis [8, 11].

5. Mental-emotional lability and tendency to stress . In stress of various genesis, the immune system is clearly reduced, and as a result, the negative effects of pathogenic microorganisms, including fungi, are increased.

6. Food anamnesis . Violations of food storage rules, violations of hygienic rules and conditions at the place of their transportation, various pathogenic fungi in products, including Candida (often in dairy products), Rhizopus (black mold in bread, vegetables and fruits, especially onions), Alternaria alternata (in potatoes, tomatoes in the form of black dots), Botrytis cinerea (gray mold on grapes, cabbage, lettuce, tomatoes), Aspergillus (black spots on tea bags, black pepper powder, coffee, fruits, confectionery products). Atopics and children with sensitivity to fungi after eating contaminated dairy products, vegetables and fruits, fungal varieties of cheese, leavened bread products, home-made canned products, adult patients - vegetables, jam, beer, champagne, wine, kvass, kefir (i.e. It is observed that symptoms of the disease appear after eating baked goods), leavened bread and elevated dough products. Allergic reactions are often caused by fungi of the genera Candida, Alternaria, Aspergillus [14]. Allergic diseases of the gastrointestinal tract, skin, and respiratory organs may develop when the allergen is ingested enterally (that is, after consumption of food products containing mold fungi). As a result of communication with fungi, symptoms of skin damage such as hives, angioneurotic edema, atopic dermatitis (Candida and Malassezia fungi can live on the skin) are observed [11].

7. Drug anamnesis . Children often have respiratory diseases from early infancy, and frequent, long-term and uncontrolled use of antibacterial therapy and glucocorticoids can lead to complications such as intestinal microbiota disturbance, breathing difficulties, and bronchial asthma attacks.

If a positive fungal anamnesis is detected in patients, a special allergological examination should be ordered for them. Determination of immunoglobulin E specific for mold and yeast fungi is an urgent problem, and allergic bronchopulmonary diseases in children are characterized by a high frequency of complications, severe and chronic course, unreliability and ineffectiveness of generally accepted treatment schemes when accompanied by sensitivity to fungi [8, 11].

In vitro diagnosis of specific IgE to food, plant, fungus, epidermal, latex and other allergens of the external environment is important in the diagnosis of bronchopulmonary diseases, allergodermatoses and other atopic diseases. during the period, even infants and pregnant women can be tested, there are no restrictions on age and various chronic diseases.

republic, using immunoblot allergen panels, using in vitro allergological diagnosis (Cladosporum herbarum, Penicillinum notatum, Candida albicans, Alternaria alternata, Aspergilus flavus, Aspergillus fumigatus, Aspergillus niger, Aspergillus versicolor, Mucor mucedo, Rhizopus nigricans) expanded. With the help of these allergen panels, it is now

possible to diagnose and effectively treat children, pregnant women, nursing mothers, and people of different ages.

Conclusion . Today, the opportunities for determining susceptibility to fungi have expanded, requiring new approaches to the development of preventive, diagnostic and treatment programs for doctors working in various areas of medicine. In order to prevent sensitivity to fungi, it is important to pay attention to the composition of the patient's diet, living conditions, and timely treatment of concomitant diseases.

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