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Diagnostics And Therapy Of Eye Allergic Diseases.

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Abstract. This paper represents literature review devoted to most actual ussues of diagnostics and therapy of eye allergic diseases. Information about modern methods of diagnostics of allergic conjunctivitis that used in clinical practice was systemized. Data from clinical tests on different drug groups and their effectiveness was delivered. Also there was performed comparative analysis of therapy plans that prescribed by different authors.
Key words: allergy; allergic conjunctivitis; pollinoses

Allergic diseases represent one of the most important medico-social problems of today, as over the past two decades, the frequency of allergic diseases has significantly increased, especially in economically developed countries and in regions with poor environmental conditions. According to some scientists' forecasts, the 21st century will be the era of allergic diseases [7, 15].

In the last 30-35 years, there has been an exponential increase in the prevalence of many allergic diseases, including allergic conjunctivitis (AC) [2]. The average global prevalence of AC ranges from 15% to 25%, with rates in children approaching 40%. Epidemiological studies conducted in different regions of the world show that the prevalence of allergic diseases ranges from 3.3% to 35%, with an average of 16.5% [4, 25].

The most common manifestations of allergic diseases are allergic rhinitis (95-98%), allergic conjunctivitis (91-95%), and pollen-induced bronchial asthma (30-40%) [16].

The etiological factors that cause AC symptoms include airborne allergens, which are typically divided into three groups:

1. Aeroallergens of the external environment (plant pollen, environmental exposure);
2. Aeroallergens in the home (house dust mites, animals, insects, mold, some household plants);
3. Occupational allergens.

The development of allergic diseases is based on immunological mechanisms, with the immediate, IgE-dependent type of allergic reactions being predominant. The onset of immune reactions can occur in the presence of atopy. AC, whether perennial or seasonal, is a classic example of an IgE-mediated allergic reaction of the first type. The main participants in the allergic inflammation of the nasal mucosa and conjunctiva are mast cells, eosinophils, lymphocytes, as well as basophils, dendritic, and endothelial cells (9). The involvement of these cells determines the early and later phases of the allergic reaction. When allergen-specific IgE is fixed on its high-affinity Fcε receptors I type (FcεRI) on mast cells, the conjunctiva has universal mechanisms for antigen recognition. If allergen-specific IgE is present on the FcεRI of mast cells, each molecule of the allergen that enters this receptor binds cross-linking two neighboring antibody molecules, linking the IgE and FcεRI molecules on the cell membrane. This mechanism triggers the activation of mast cells, leading to their degranulation, which results in the release of inflammatory mediators into the extracellular space. These mediators act on the cell structures of the mucosa and within minutes initiate the allergic inflammation process, causing the well-known symptoms of AC.

The early phase of the allergic reaction is accompanied by intense plasma exudation—the leakage of fluid containing proteins and a significant amount of biologically active substances through the blood vessel walls into the intercellular space. The late (delayed) phase of the allergic response develops hours after the resolution of the early phase, even without re-exposure to the allergen. Its severity varies significantly and does not correlate with the intensity of the early phase [10].

The late phase of the allergic reaction is characterized by secondary elevation of pro-inflammatory mediators and an increase in the number of eosinophils and basophils in the mucosal layer.

The course of the disease can be classified as acute allergic conjunctivitis, which is characterized by redness of the conjunctiva and chemosis combined with tearing and a burning sensation in the eyes, which occurs with sudden contact with allergens (animals) or irritants (gasoline vapors, etc.).

Chronic allergic conjunctivitis is a continuous non-infectious inflammatory process occurring in the conjunctiva and manifested by hyperemia, mild swelling, and folliculosis against a background of variable

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subjective symptoms, from complete absence of complaints to moderate and severe manifestations with possible periods of exacerbation [11].

Clinical forms include:

Seasonal allergic conjunctivitis (hay fever)

Perennial chronic conjunctivitis

Spring keratoconjunctivitis

Atopic conjunctivitis

Drug-induced conjunctivitis

Giant papillary conjunctivitis

Diagnosis. In some cases, the typical clinical picture of the disease or a clear connection with the impact of an external allergenic factor leaves no doubt about the diagnosis. However, in most cases, diagnosing allergic eye diseases is associated with significant difficulties and often requires the use of specific allergological testing methods [5].

The allergological history is the most important diagnostic factor, which, according to our data, helps to identify the "culprit" allergen in 70% of cases [5, 15].

Laboratory allergodiagnostics is highly specific and can be performed during the acute phase of the disease without causing harm to the patient. The detection of eosinophils in conjunctival scrapings is of significant diagnostic value. Methods for quantitative determination of total and allergen-specific IgE concentrations have a specificity of about 90% and can be performed even in the presence of comorbid skin diseases, with no effect on the results when antihistamines and glucocorticoids are concurrently used. In recent years, it has become possible to determine allergen-specific IgE for a large number (120) of allergens in a single blood sample (AllergoChip). This allows for more accurate diagnosis in complex cases and helps select patients for allergen-specific immunotherapy [1, 11].

Differential diagnosis of allergic eye diseases should not only include non-specific diseases but also bacterial and fungal infections. Special attention and difficulty lie in diagnosing atopic eye damage in isolated forms of the disease. Therefore, a correct and adequate choice of therapy is essential for the prognosis and outcome of the disease [5].

The impact on allergic inflammation involves not only the use of pharmacotherapy but also a number of preventive measures. In cases of mild exacerbations that do not require hospitalization, treatment is conducted on an outpatient basis with dynamic monitoring by an allergist-immunologist, adjusting therapy based on the patient's condition [9].

Pharmacotherapy for allergic eye diseases. During an exacerbation of the allergic condition, the primary focus is on choosing the right patient management tactics. Acute exacerbation control and allergy symptom management are achieved with a range of medications from various pharmacological groups [13, 29]. Developing an individual complex of anti-allergic drugs should take into account the clinical picture of the disease, anthropometric data, and physiological characteristics of the patient.

The main list of medications used for treating allergic diseases includes:

1. Mast cell stabilizers
2. Antihistamines
3. Glucocorticosteroids
4. Other medications

Allergen-specific immunotherapy (ASIT) involves administering small doses of the antigen responsible for the condition in a specific patient. This results in desensitization to that antigen. Indications for ASIT include cases where complete and permanent avoidance of the specific allergen is impossible (household and pollen allergies). ASIT reduces symptoms and the need for medication and has the potential for long-term clinical effects, preventing the development of allergy and its symptoms. The effect of ASIT is mediated through several main immunological mechanisms: suppression of eosinophil concentration, shortening the duration of the delayed hypersensitivity phase, and promoting a shift from a Th2-type to a Th1-like immune response. Regulatory T cells play a key role in this process, significantly influencing the suppression of the Th2 response. One of the mechanisms for this is an increase in the production of specific IgG antibodies, particularly IgG4. Shifting the balance between IgE and IgG4 towards increased IgG4 production is crucial

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for successful ASIT. It has been shown that allergen-specific IgG4 antibodies remain after treatment and may provide long-term clinical tolerance. To date, two groups of ASIT medications have reached clinical practice: allergens and allergoids (chemically modified allergens that increase immunogenicity and reduce the incidence of adverse allergic reactions) [1, 25, 28].

It is important to note that in severe exacerbations, a wider range of medications, both symptomatic and aimed at managing systemic disorders, septic complications, and others, are usually employed. In cases of severe exacerbations with signs of multi-organ failure (including severe reactions to medications), fixed combinations of histamine receptor blockers, mast cell stabilizers, non-steroidal anti-inflammatory drugs, and detoxification therapy methods are used. When infectious complications occur, antibacterial and antifungal treatments are applied, along with sanitation procedures.

Thus, the treatment of allergic eye diseases is a comprehensive approach aimed at managing and preventing allergic inflammation, using both pharmacological and non-pharmacological interventions [12, 20]. The application of specific medications should be well-considered and justified. Only a comprehensive approach to managing patients with allergic diseases can ensure the best possible treatment outcomes [17].

Under current conditions, research focused on studying and timely diagnosing the environmental state and population morbidity largely depends on the creation and functioning of ecological-medical monitoring systems. Until recently, issues related to the organization and improvement of allergological assistance were addressed without a comprehensive analysis of the environmental, social-hygienic, and other factors contributing to the development of allergic diseases [5, 14].

The presence of chemical, electrical, construction, machinery manufacturing, and metalworking industries in the Republic of Uzbekistan contributes to the elevated concentrations of various specific pollutants in the atmosphere [3].

According to expert estimates, the entire territory of Tashkent falls within a zone of very high ecological load, referred to as the "discomfort zone."

The country is undertaking a range of reforms in the healthcare system, with several regulatory acts aimed at improving specialized, emergency, and urgent medical care and the protection and strengthening of citizens' health. Despite positive results, there are still significant problems and gaps in the diagnosis, treatment, and prevention of allergic diseases. This led to the signing of the Presidential Decree of the Republic of Uzbekistan Sh.M. Mirziyoyev on May 11, 2018, "On Measures to Improve the Prevention, Diagnosis, and Treatment of Allergic Diseases," which establishes centralized systems for the prevention, molecular diagnostics, and treatment of allergic diseases based on fundamental and applied research in allergology. The decree also mandates the development of innovative methods for prevention, diagnosis, and treatment, as well as improving healthcare institutions' access to medicines and enhancing the training and retraining of specialists in clinical allergology and immunology [18].

REFERENCES

1. Afinogenova V.P., Lukachev I.V., Kostinov M.P. Immunotherapy: Mechanism of Action and Clinical Application of Immunocorrective Drugs. // The Treating Doctor. - 2010. - No. 4. - P. 75-78.
2. Anikeeva S.B., Beseda N.M., Voloskova T.V. Seasonal Allergic Conjunctivitis. // Pollinoses. - 2009. - No. 10. - P. 9-12.
3. Bakhritdinova F.I. Etiopathogenesis, Clinical and Epidemiological Features, and Treatment of Allergic Conjunctivitis in Pollinosis in Uzbekistan. - Moscow: Mysl, 2000. 202 p.
4. Varlashkina L.P., Dovgalyuk S.M. Differential Diagnosis of Perennial Allergic Conjunctivitis. // Russian Medical Bulletin. - 2010. - No. 3. - P. 22-24.
5. Dolukhov H.A. Principles of Treatment for Patients Suffering from Allergic Conjunctivitis. // Doctor. - 2010. - No. 2. - P. 35-36.
6. Gilyaletdinova L.G., Vasyutin A.Y., Zakrzhevskaya L.T. Spring Keratoconjunctivitis (Spring Catarrh). // Bulletin of Ophthalmologists. - 2010. - No. 3. - P. 36-38.
7. Giverts N.B. Allergic Conjunctivitis Associated with Bronchial Asthma. // Clinical Pediatrics. - 2009. - No. 5. - P. 16-18.
8. Zharkovskaya O.Y. Inflammatory Reactions of the Conjunctiva. // New Ophthalmological Bulletin. - 2009. - No. 6. - P. 34-37.

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9. Kazinets A.V. Scientific Comparison of Rehabilitation Technologies in the Sanatorium and Polyclinic Stages for Patients with Chronic Allergic Conjunctivitis. // Author's abstract of thesis. – Moscow – 2011. - 26 p.
10. Kryukov A.I., Ivoylov A.Yu., Pakina V.R., et al. Drug Therapy for Allergic Rhinitis in Children. Medical Council. 2014. 3: 55-60.
11. Kurbacheva O.M. Pollinosis. // Modern Aspects of Diagnosis and Treatment of Allergic Diseases: Conference Proceedings, Moscow, 2009. - P. 31-37.
12. Maichuk D.Yu. Ocular Surface Diseases Induced by Contact Lenses. // New in Ophthalmology. – 2012. No. 3 – P. 49-53.
13. Maichuk Yu.F. Conjunctivitis. Modern Drug Therapy. A Brief Guide for Doctors. – Moscow – 2013. – 36 p.
14. Mirziyoyev Sh.M. Presidential Decree "On Measures to Radically Improve the Prevention, Diagnosis, and Treatment of Allergic Diseases". – Tashkent - 2018.
15. Tulupov D.A., Karpova E.P. Drug Therapy for Allergic Rhinitis in Children. Medical Council. 2015. 1: 72-75.
16. Santalov V.V. Allergic Conjunctivitis in Contact Lens Wearers. // Russian Medical News. - 2010. - No. 3. - P. 25.
17. Silevich V.G. Pollinosis Conjunctivitis. // Journal of Russian Medicine. - 2010. - No. 7. - P. 56-58.
18. Khaitov R.M., Ilina N.I. Allergology. Clinical Recommendations. - Moscow, GEOTAR-Media Publishing Group, - 2006, - 227 p.
19. Avunduk AM, Tekelioglu Y, Turk A, Akyol N. "Comparison of the effects of ketotifen fumarate 0.025% and olopatadine HCl 0.1% ophthalmic solutions in seasonal allergic conjunctivities: a 30-day, randomized, double-masked, artificial tear substitute-controlled trial". Clin Ther. – 2005.-27 (9): 1392-402.
20. Quianta L. Moore, Cintia S. De Paiva, Stephen C. Pflugfelder Effects of Dry Eye Therapies on Environmentally Induced Ocular Surface Disease // American Journal of Ophthalmology. – USA, 2015.-Volume 160, Issue 1. - Pages 135-142.
21. Marwan Abdulaal , Rafic Antonios, Anita Barikian, Mahmoud Jaroudi, Rola N. Hamam Etiology and Clinical Features of Ocular Inflammatory Diseases in a Tertiary Center in Lebanon // Ocular Immunology and Inflammation.- - Beirut, 2020 - Issue 4, Volume 23. - P. 271-277.