



Choosing an Antihistamine to Treat Seasonal Allergies

Matniezova Zainab Tukhtaboevna ¹

¹ Bukhara State Medical Institute

Abstract: Seasonal allergies caused by plant pollen are recognized as one of the most common allergic diseases. Data on the prevalence of seasonal allergies are presented, immunological mechanisms, clinical manifestations, modern methods of diagnosis and therapy are considered. The concept of seasonal allergy treatment is based on the control of clinical symptoms. Special attention is paid to first-line antihistamines in the treatment of seasonal allergies.

Keywords: Antihistamines, allergia, senna.

The review will also focus on the properties of desloratadine. A number of studies involving tens of thousands of patients have shown that desloratadine is highly effective in relieving the symptoms of seasonal allergic rhinoconjunctivitis, is well tolerated by patients and improves their quality of life. Key words: seasonal allergy, allergic rhinoconjunctivitis, antihistamines, desloratadine. Allergic diseases occupy one of the leading places in terms of prevalence all over the world, especially in developed countries. They mainly affect children, adolescents and able-bodied adults. Unfortunately, according to the results of numerous epidemiological studies, the incidence of pollen allergy among both adults and children is steadily increasing [1, 2]. The prevalence of pollinosis and the spectrum of causally significant allergens depend on many factors: geographical, climatic, agricultural culture, allergenicity, and the degree of environmental pollution. [3] Pollinosis (pollen allergy, hay fever) is a disease that is based on an immediate allergic reaction. It is characterized by acute allergic inflammation of the mucous membranes of the stomach respiratory tract, eyes, and skin. The development of the disease coincides in time with the dusting of certain plants, so it is characterized by seasonality and repeatability. Pollinosis is classified as a genetically determined pathology. However, it is not the disease itself that is inherited, but the predisposition to it. Most often, the first symptoms of pollinosis appear at the age of eight to 20 years. However, the disease can develop in both young children and older people [6]. Among urban residents, the incidence is four to six times higher than among rural residents [7]. The most frequent manifestations of pollinosis include allergic rhinitis (AR) (95-98%). While the immediate symptoms of AR are always the focus of medical attention, the psychological and psychosocial aspects are often overlooked. A standardized assessment of quality of life shows a negative impact of AR on daily life in 62% of patients. About 80% of patients report drowsiness and, consequently, increased daytime fatigue, and reduced cognitive functioning [8]. This leads to negative consequences for family and social life, and reduces intellectual abilities [9]. The consequences of allergic rhinoconjunctivitis (ARC) can be especially significant in adolescents who are dependent on the assessment of others, who are prone to exaggeratedly negative assessments even. Seasonal allergies caused by plant pollen are recognized as one of the most common allergic diseases. Data on the prevalence of seasonal allergies are presented, immunological mechanisms, clinical manifestations, modern methods of diagnosis and therapy are considered. The concept of seasonal allergy treatment is based on the control of clinical symptoms. Special attention is paid to first-line antihistamines in the treatment of seasonal allergies. The review will also focus on the properties of desloratadine. A number of studies involving tens of thousands of patients have shown that desloratadine is highly effective in relieving the symptoms of seasonal allergic rhinoconjunctivitis, is well tolerated by patients and improves their quality of life.

Keywords: seasonal allergy, allergic rhino conjunctivitis, antihistamines, дезлоратадинших desloratadine avoid health defects.

Adolescents with ARC may have difficulty falling asleep, staying awake at night, and snoring, and tend to have poorer sleep, negatively affecting school attendance and daily activities. ARCS in adolescents can be a factor influencing learning and further career development [10,11]. Etiology From for several thousand plants, only 50 can cause pollinosis. Pollen of wind-pollinated plants should be light and volatile, small in size (from 20 to 35 microns), and have a pronounced antigenic activity. The concentration of pollen in the air is also important – from ten to 50 grains per 1 m³ [6]. In European and central Russia, there are three periods of pollinosis: • spring – from mid – April to late May, associated with tree dusting; • summer-from early June to late July, due to dusting of meadow grasses, cultivated cereals; • summer-autumn-from late July to late September, associated with flowering weeds. These dates can be shifted by seven to ten days, depending on meteorological conditions. The severity of symptoms depends not only on the number of pollen grains in the air, but also on the individual reactivity of patients [12]. Plant pollen has a complex antigenic composition and can contain from five to ten allergenic components. At the same time, antigenic proteins can be present both in pollen and in other parts of the plant (seeds, leaves, stems, fruits). This leads to the intolerance of patients with pollinosis to herbal preparations and the development of cross-food allergies (tab. 1) [7]. Pathogenesis A schematic representation of the mechanism of development of allergic is shown in Figure 1. The main participants in allergic inflammation in the nasal mucosa, bronchial tree, and conjunctiva caused by the interaction of the allergen with specific IgE antibodies are mast cells (TC), eosinophils, lymphocytes, epithelial and endothelial cells. Allergen -specific IgE antibodies, which are formed in excess upon contact with an allergen in individuals predisposed to, are fixed on high-affinity receptors for them on mast cells. The next contact with the allergen and binding of the latter to mast cell-fixed IgE antibodies.

Possible allergic reactions Pollen, leaves, stems of plants: Plant foods: Medicinal plants: Birch, alder, Hazel, apple, etc. trees. Birch juice, apples, pears, kiwis, cherries, plums, peaches, apricots, cherries, olives, hazelnuts, walnuts, almonds, carrots, herbs and spices (celery, dill, curry, anise, cumin, onions), potatoes, tomatoes, cucumbers. birch leaf, birch buds, alder cones, buckthorn bark, etc. Grasses timothy, oatmeal, hedgehog, oats, wheat, barley, rye, corn, etc. beer, kvass, corn, peanuts, legumes, cereals and pasta; bread and bakery products or other products made from cereals or products containing their flour; strawberries, citrus fruits, sorrel All grasses of weeds quinoa, ragweed, dahlia, daisies, dandelion, chrysanthemum, cornflower, sunflower, etc. Sunflower oil and halva, mayonnaise, mustard, chicory; drinks made with wormwood (vermouths, balsams); melons; herbs and spices (celery, dill, cumin, parsley, curry, pepper, anise, nutmeg, cinnamon, ginger and coriander), carrots, garlic, citrus fruits, bananas, beets, spinach, kiwi, mango, carrots, tomatoes, peas, hazelnuts, peanuts wormwood, chamomile, calendula, mother-and-stepmother, elecampane, turnip, yarrow, tansy, plantain, etc.

They promote the activation of mast cells and the secretion of mediators of allergic inflammation: histamine, tryptase, prostaglandin, bradykinin, cysteinyl leukotrienes (LT) C₄, D₄, E₄, platelet activation factor (FAT), tumor necrosis factor alpha (TNF-alpha), colony-stimulating factor of granulocytes and macrophages GM-CSF). The effect of mediators on vascular endothelial cells and neuroreceptors of the nasal mucosa, conjunctiva leads to the appearance of clinical symptoms of pollinosis (itching, sneezing, rhinorrhea, nasal congestion, lacrimation, conjunctival hyperemia). This is the early phase of an allergic response. After 6-8 hours, a late phase of the allergic reaction (cellular inflammatory response) develops, which does not require additional contact with the allergen. Histamine is actively involved in the formation of both the early and late phases of an allergic reaction, causing the vast majority of clinical manifestations of pollinosis. Being the most important mediator of an immediate allergic reaction, histamine has a wide range of biological activity. Its action is carried out by activating cell surface specific H₁-, H₂-, H₃ -, and H₄-receptors. The main effects of histamine as a result of activation of H₁ receptors are expressed in increased vascular permeability, edema, hypersecretion, and smooth muscle spasm [14]. The most frequent manifestations of pollinosis are allergic rhinitis (AR) – 95-98%, allergic conjunctivitis (AK) – 91-

95%, pollen bronchial asthma – BA) - (30-40% of patients) [7]. Despite the fact that AR usually focuses on nasal symptoms, more than 80% of patients, as practice shows, suffer from eye symptoms. According to European and North American studies, more than 70% of patients with seasonal AR suffer from both nasal and ocular symptoms, and the majority of patients rate their severity оцениваются moderate or severe [15,16,17]. Several studies have shown that ocular symptoms increase the role of rhinitis as a provoking factor in the development of bronchial asthma and affect daytime activity in children [18]. The mechanism of formation of ocular symptoms may be different. On the one hand, direct exposure of the allergen to the eye mucosa leads to the development of a local allergic reaction and typical allergic conjunctivitis. However, in recent years, it has been shown that one of the causes of ocular symptoms may be naso-ocular a reflex that occurs as a result of stimulation of the parasympathetic nerves by mediators of allergic inflammation of the nasal mucosa, primarily histamine [19]. Pollinosis is characterized by seasonality and acute, recurrent clinical manifestations. The severity of seasonal exacerbation of the disease depends on the concentration of pollen in the air, the duration of the pollen season, and the degree of individual sensitivity. Features of the clinical course of pollinosis: seasonality associated with the flowering period of plants • close connection with staying in a certain area • combination of pollinosis with drug allergy to drugs of plant origin; • combination of pollinosis with cross-food allergy; • weather influence on the course of pollinosis (exacerbation of symptoms in dry, sunny, windy weather while in wet, rainy weather, patients experience some relief due to a decrease in pollen concentration in the air); • during the period of clinical manifestations of pollinosis, synergistic allergy syndrome is characteristic (clinical manifestations occur on other groups of allergens to which patients do not respond outside the dusting season); • during the palination season палинации, exacerbation of chronic diseases is characteristic (CHD, peptic ulcer, etc.); • asepticism (if a secondary infection does not join); • paroxysmal (most pronounced manifestations in the morning and afternoon hours, when the maximum amount of pollen is in the air). A typical manifestation of pollinosis is rhinoconjunctival syndrome: itching and redness of the eyes, foreign body sensation in the eyes, photophobia, lacrimation, and in severe cases blepharospasm. At the same time, there is itching in the nose, nasopharynx, ear passages, profuse runny nose, sneezing attacks, difficulty in nasal breathing (most often bilateral, of varying degrees), hyperemia and maceration of the skin of the vestibule and wings of the nose, olfactory disorders such as anosmia or hyposmia. Allergic inflammation can involve the sinuses, nasopharynx, auditory tubes, and larynx, causing the development of sinusitis, eustachitis, pharyngitis, and laryngitis [20]. If rhinitis is treated unsuccessfully, children may develop secondary complications, such as acute or chronic sinusitis, eustachian tube dysfunction, and otitis media. These disorders, in turn, can lead to speech delays in children and, in rare cases, permanent hearing loss. In children, rhinitis can also contribute to craniofacial abnormalities [10]. Some patients have skin manifestations of allergies: contact urticaria, atopic dermatitis and contact dermatitis. Contact urticaria is characterized by a clear seasonality, in rare cases it can be the only clinical manifestation of pollinosis. Contact allergic dermatitis is a rare manifestation of pollinosis. It can occur in exposed areas of the skin when it comes into contact with the leaves or stems of plants. It is manifested in the form of hyperemia with subsequent vesicular rashes on the affected areas. Clinical symptoms of cross-reactivity include oral allergic syndrome, gastrointestinal symptoms, acute urticaria, and angioedema. and anaphylactic shock. [7] Reliable diagnosis of pollinosis depends on careful interpretation of anamnesis, complaints, and the results of physical, general clinical, and allergological examinations. Allergological history Collection of anamnesis that is of primary importance in the diagnosis of pollinosis includes – - the presence of allergic diseases in the family or in the patient himself; - the relationship of symptoms with a certain time of year (seasonality of manifestations) – - dependence on weather conditions – - being on the street, outside the city; - change of residence or climate during the season. Physical examination To assess the symptoms of pollinosis, it is advisable to conduct – - anterior rhinoscopy and / or endoscopy, [21, 22]; – microscopy of a smear from the nasal cavity; - measurement of the nasal peak inspiratory velocity, rhinomanometry, test "Breathing with the mouth closed " [23]; - ophthalmoscopy [24]; - radiography of the paranasal sinuses; - assessment of concomitant diseases (asthma, sinusitis, laryngitis, pharyngitis, chronic otitis media, hearing loss, headache) – - assessment of the quality of life [25, 26–; - study of the function of external respiration using a bronchodilator

test. [27]. Allergological diagnostics Performing specific allergological diagnostics, including setting up skin tests with allergens, determining specific IgE antibodies, and, if necessary, performing a nasal and / or conjunctival provocative test with specific allergens. All methods of special diagnostics are performed by allergist-immunologists in specially equipped rooms. Skin tests (pricktests, scarification and intradermal) are performed in the remission phase of an allergic disease, after the withdrawal of antihistamines. In case of impossibility of conducting skin tests, difficulties of interpretation their results, as well as failures to identify the "guilty" allergen, determine the specific IgE in the blood serum. In recent years, molecular allergodiagnosics (MA) has been used to improve the accuracy of the diagnosis and prognosis of allergies [28]. The results of skin and laboratory tests should be compared with the symptoms of the disease, since the presence of sensitization to allergens is not always accompanied by clinical manifestations. If there is a discrepancy between the data of an allergic history and the results of skin tests, provocative tests with allergens (nasal, inhaled, conjunctival) are performed [29].

Prevention Primary prevention of pollinosis is aimed at preventing the development of pollen allergies and includes: - limiting the total antigenic load – - rational nutrition; - using methods of physical recovery and hardening; - rational landscaping of cities (using non-allergenic plants); – for parents with atopic diseases, planning the birth of a child outside the dusting season. Secondary prevention of pollinosis, aimed at preventing the deterioration of the condition in people who already suffer from pollinosis, provides: - training the patient and his family members in ways to treat and prevent pollen allergies; - monitoring the concentration of pollen in the room (closed windows and doors, air conditioning, humidifiers and air purifiers, water vacuum cleaners); - staying in a safe environment. other climatic zones during the flowering period; - restriction of going outside in sunny, windy weather; - exclusion from the diet of products with cross-allergenic properties – - restriction of exposure to non-specific irritants (lacquers, paints, chemicals) – - timely diagnosis, adequate pharmacotherapy and allergen-specific immunotherapy (ASIT) – - do not carry out preventive vaccinations and planned surgical interventions during the period of pollination of plants that are allergic to pollen [7].

Treatment The goal of treatment is to completely control the symptoms of pollinosis. Its main principles are: - prevention or reduction of contact with allergens and triggers – - application of pharmacotherapy; - allergen-specific immunotherapy; - patient education. Elimination programs measures Allergen elimination reduces the severity of pollinosis symptoms and the need for medical treatment. So, if patients are allergic to plant pollen during the flowering season, it is recommended to: - limit the time spent outside, especially in dry, windy weather in the morning; - use air purifiers that capture plant pollen indoors; - change the climate zone; - wear dark glasses to reduce the ingress of pollen on the mucous membrane of the eyes; - take care of the following conditions: returning home to change clothes, take a shower. It is not recommended to: - frequently ventilate the premises at work and at home, as well as open car windows, especially in the early morning hours; – go out of town or into nature; - use herbal medicines, cosmetics of plant origin; – carry out preventive vaccinations and planned surgical interventions [6]

Allergen-specific immunotherapy Allergen-specific immunotherapy – this is treatment with increasing concentrations and doses of the allergen administered subcutaneously or sublingually. ASIT has fundamental advantages over all other methods of therapy, since it does not affect the symptoms of the disease, but modifies the nature of the body's response to the allergen, interferes with the pathogenesis of the disease itself, and therefore affects all pathogenetic links of the allergic reaction. This treatment is performed only under the supervision of an allergist-immunologist [30].

Pharmacotherapy To achieve disease control, the following drugs are used: – systemic and topical antihistamines; - topical corticosteroids – - mast cell membrane stabilizers (intranasal and intraocular cromones); – antileukotriene drugs. Symptomatic medications include: - topical and systemic decongestants; – – - intranasal anticholinergics; - systemic corticosteroids. Considering that the most frequent manifestation of pollinosis is allergic rhinitis, it was noted that it is antihistamines (AHPs) that are most often used in the treatment of hay fever.

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