

Risk Factors and Prevalence of Allergic Rhinitis in Adolescence

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Annotation: Allergic rhinitis, being one of the most common allergic diseases, represents a significant medical and social problem. Allergic rhinitis (AR) is one of the most common diseases of the respiratory system, affecting up to 40% of adults and up to 25% of children. This is an indirect inflammatory reaction that develops as a result of allergens entering the nasal mucosa and is clinically manifested by inflammation of the nasal mucosa caused by a causally significant allergen, and is clinically manifested daily for at least an hour by two or more symptoms: profuse rhinorrhea, nasal congestion, itching in the nasal cavity, repeated sneezing and often loss of smell.

Keywords: allergic rhinitis, pathogenesis, diagnosis, treatment.

Relevance: Allergic rhinitis is a disease characterized by IgE-mediated inflammation of the nasal mucosa, which develops under the influence of allergens, and the presence of at least two of the following symptoms that appear daily for an hour or more: nasal congestion (obstruction), nasal discharge (rhinorrhea), sneezing, itching in the nasal cavity [1]. Allergic rhinitis is a problem faced by patients of any age. This disease leads to the development of serious disorders, disability, social problems, negatively affecting sleep, school learning, work, well-being and quality of life. Allergic rhinitis is the most common allergic disease in the world, affecting approximately 615 million people. The prevalence of allergic rhinitis in the adult population is 10–30% and reaches 42% among children. The average age of onset of the disease is 10 years, and the largest number of cases is recorded between the ages of 13 and 19 years [2]. Allergic rhinitis is an immunoglobulin (Ig)E-mediated inflammatory disease of the nasal mucosa associated with exposure to allergens in genetically predisposed individuals; characterized by sneezing, nasal congestion, nasal itching and rhinorrhea. Many patients with allergic rhinitis have symptoms of conjunctivitis, and ocular symptoms are often associated with the severity of nasal symptoms [3]. Allergic rhinitis is a widespread disease that negatively affects the quality of life of patients and represents one of the most pressing problems of modern otorhinolaryngology and allergology [3]. Allergic rhinitis plays an active role in the pathogenesis of bronchial asthma, which occurs in 20–40% of patients with allergic rhinitis, and AR is diagnosed in 60–70% of children with bronchial asthma [4]. This is due to the structural and functional unity of the mucous membrane and the general mechanisms of development of the inflammatory process in the upper and lower respiratory tract. The main etiological factors of AR are pollen from trees, meadows and weeds, as well as mold spores (*Alternaria*, *Aspergillus* and others), household allergens (house dust mites; cockroaches), animal epidermis. The main pollen allergens are usually water-soluble proteins or glycoproteins [4]. The pathogenesis of allergic rhinitis is based on an immediate allergic reaction. According to the modern classification, depending on the nature of the course of the disease, it is customary to distinguish between intermittent and persistent forms. Currently, intranasal glucocorticosteroids remain the drugs of choice in the treatment of patients with allergic rhinitis. However, the presence in a patient of a concomitant pathology of the nasal cavity, for example, a deviated nasal septum, not only significantly worsens the course of the nasal inflammatory process, but also creates obstacles to the adequate delivery of topical medications to all parts of the nasal cavity, which, in turn, reduces their effectiveness. For patients suffering from allergic rhinitis in combination with other pathologies of the nasal cavity, combination oral medications can be a good alternative to intranasal sprays. Of particular interest to doctors is the emergence of a combined antiallergic drug, which includes a leukotriene blocker and a second-generation H₁-histamine receptor blocker - montelukast and levocetirizine. The drug can be used in both adults and children over 15 years of age for the treatment of intermittent and persistent forms of allergic rhinitis. Timely and correctly administered therapy for allergic rhinitis can eliminate the symptoms of

the disease and prevent the development of complications [5]. According to the ARIA classification (2016), AR is divided into:

1. By the nature of the flow:

- a) intermittent (symptoms bother you less than 4 days a week);
- b) persistent (symptoms bother more than 4 days a week or more than 4 weeks a year).

2. According to the severity of the current:

a) mild (minor clinical manifestations of the disease that do not interfere with the patient's daily activity and sleep);

b) average (the patient's quality of life is significantly impaired: performance suffers, sleep is disturbed);

c) severe (sharply expressed symptoms that disrupt the patient's usual lifestyle if he does not receive treatment) [9]. The diagnosis of allergic rhinitis is established on the basis of anamnesis, characteristic clinical symptoms and identification of causally significant allergens (by skin testing or determining the titre of specific antibodies of the IgE class in vitro if skin tests are not possible) [6]. Features of the clinical picture of allergic rhinitis; clinical symptoms of AR can be divided into three groups: Main clinical symptoms: watery nasal discharge - rhinorrhea; paroxysmal sneezing; itching or burning sensation in the nose; nasal congestion, characteristic mouth breathing, snoring, snoring; decreased sense of smell. Additional symptoms: nosebleeds due to forced nose blowing; sore throat, prolonged pain when swallowing; non-productive obsessive cough; "crackling" or "clicking" sensation in the ears (especially when swallowing), hearing impairment (manifestations of allergic tubo-otitis). Nonspecific symptoms: weakness, malaise, irritability; headache, difficulty concentrating; sleep disturbance, depressed mood; rarely - increased body temperature. One of the leading reasons for late diagnosis and initiation of adequate therapy for AR is the late presentation of patients to an otolaryngologist or allergist, and the unsystematic and uncontrolled use of medications that alleviate the symptoms of the disease. The average time from the appearance of the first signs of AR to diagnosis is 8–8.5 years [8,9]. The main participants in allergic inflammation are mast cells, basophils, eosinophils, lymphocytes and endothelial cells. They are involved in the immune response at different times after exposure of the sensitized mucosa to the allergen, which mediates first the early and then the late phase of the allergic reaction. During the early phase, IgE binds to the allergen and mast cell receptors. The final result of mast cell activation is the secretion of mediators that were either synthesized earlier (preceded) or formed during activation. Mediators trigger allergic inflammation and cause symptoms of AR. The late phase (after 4–6 hours) involves basophils, eosinophils and other cells. Eosinophils, adhering to endothelial cells due to adhesion molecules (VCAM-1), synthesize a number of cytokines, increasing inflammation and tissue damage. Over time, a priming effect is formed, with the development of a more pronounced reaction to a lower concentration of the allergen [7,11].

The aim of the study: To estimate the prevalence of allergic rhinitis among adolescents. To study the dynamics of prevalence and establish risk factors for its development. Determine the importance of prevention and the impact of allergic rhinitis on health.

Materials and methods of research: An assessment of the prevalence of symptoms of allergic rhinitis and risk factors for its development was carried out using a questionnaire for adolescents aged 10-14 years. The questionnaires were filled out by adolescents together with their parents during a parent-teacher meeting or at home, after informing the parents and receiving written consent to participate in the study. Over the past 30 years, there has been an increase in the prevalence of allergic diseases (AD), in the structure of which allergic rhinitis (AR) occupies one of the leading places. This pathology has a significant impact on the physical and mental health of patients and is of great social importance.

In the USA, the number of patients with AR is 25-30 million people, while AD is registered in more than 40 million people. In England, the prevalence of AR is 16%, in Denmark - 19%, in Germany - 13-17% [7].

Results: 68 parents received questionnaires to complete, 63 (92.6%) returned completed, of which 59 were incompletely or incorrectly completed and were excluded from the study. Thus, the analysis took into account the data of 59 (93.1%) adolescents whose parents filled out the questionnaires. The prevalence of AR was 18.0%. Of the 59 adolescents with AR, 37 (62.7%) had symptoms of conjunctivitis. Thus, the prevalence of ARC was 7.3%. Of the 59 children with AR, only 5.9% had a medically verified diagnosis. Of the 59 adolescents with symptoms of AR, 7 (11.8%) children had current asthma-like symptoms, 5 (8.4%) adolescents had symptoms of current atopic dermatitis. When conducting a statistical analysis, a statistically significant relationship was established between the prevalence of AR and ARC in adolescence, family history of allergic diseases and the adolescent's male gender. A family history increases the risk of developing AR in adolescence by 1.7 times. The results of previously published epidemiological studies of the prevalence of AR and ARC among adolescents, conducted using a questionnaire, are comparable to our data, in some cases significantly higher. To obtain more accurate data on the prevalence and risk factors for the development of allergic rhinitis in adolescence, when conducting epidemiological studies, along with questioning parents, it is necessary to conduct an additional examination with the participation of doctors for an accurate diagnosis.

Conclusions: The low level of referral of patients with AR in the early stages of the disease, late diagnosis of allergic diseases lead to the fact that many patients engage in self-medication for a long time, as a rule, including excessive use of decongestants and first-generation antihistamines. Examination and treatment of patients with AR should be carried out in parallel by doctors of two specialties: otorhinolaryngologists and allergists, which allows for an optimal comprehensive approach to the treatment of AR [1,8]. AR is a disease with a complex pathogenesis, the mechanisms of which continue to be studied. Knowledge of these mechanisms, modern methods of diagnosis and treatment allows us to develop an individual approach to the management of patients with AR [3,7]. Manifestations of AR have a pronounced impact on the quality of life. Patients feel irritable, depressed, and complain of fatigue, which interferes with regular attendance at school and work and leads to social and economic costs. For example, in Sweden, the annual direct and indirect costs associated with AR treatment are about 961 euros per patient. Thus, with a population of 9.5 million people, Azerbaijan costs the state 1.3 billion euros per year. In the United States, \$3.4 billion is spent annually on the diagnosis and treatment of patients with AR, of which \$2.3 billion is spent on medications and \$1.1 billion on specialist consultations. Despite the high prevalence of the disease, a pronounced decrease in the quality of life in patients, as well as a large burden on the healthcare system, AR is not given due attention; it is often misdiagnosed and is not always adequately treated [8]. Due to new knowledge about the pathogenesis of AR and the development of new medical technologies, significant progress has recently been made in the diagnosis of AR, but it still involves a combined assessment of history, sensitization with provocative testing and nitric oxide levels using microarrays. Currently, diagnostic methods for AR focus on clinical manifestations and detection of specific sensitization. In practical medicine, methods for early diagnosis and prediction of the risk of developing AR are just being developed. The search for new methods and standardization of early diagnosis is a promising direction for therapeutic and prognostic purposes [10]. An urgent problem is the development of methods for the treatment of moderate and severe CAD, complicated by foci of chronic infection of the oropharynx and nasopharynx, when ASIT is impossible and pharmacotherapy is not sufficiently developed. Thus, treatment for AR, taking into account the possibility of combination with bronchial asthma and allergic conjunctivitis, should be comprehensive [11].

Patients should be informed about the nature and methods of eliminating causative allergens to reduce the likelihood of unwanted exposure. Proper technique for administering intranasal sprays/drops must be demonstrated for the most effective treatment and to avoid potential side effects of the drug [8,11]. If the parents follow all the doctor's recommendations, the disease is eliminated completely or goes into stable remission. As preventive measures to avoid the development of allergic forms of rhinitis in children, it is advisable to: eliminate or minimize exposure to allergens, promptly treat upper respiratory tract infections, ensure a suitable indoor microclimate (no higher than 22 degrees Celsius with a humidity of at least 50%), devote time to hardening, physical activity, monitor the teenager's nutrition. Patients

and their parents should receive full information regarding the nature of the disease, the likelihood of its progression, and the need for appropriate therapy. It is also necessary to dispel concerns about the safety of the drugs used. A detailed explanation regarding the goals of treatment, the expected effect of therapy, and potential side effects can prevent the development of false hope for a quick recovery and increase patient compliance.

REFERENCES

1. K.S. Pavlova “SSC “Institute of Immunology”” FMBA of Russia, Moscow. Allergic rhinitis. Medical Council No. 1 2013. 89-96.
2. E.P. Terekhova, D.V. Terekhov. Allergic rhinitis: modern methods of therapy. Medical advice. No. 17, 2016. 74-79.
3. S.A. Rebrova. Allergic rhinitis: pathogenesis, diagnosis, treatment. <https://doi.org/10.26442/20751753.2023.3.202047>. Consilium medicum. 2023;25(3):147–151.
4. Kryukov A.I., Bondareva G.P., Thao N.T.F. Prevalence and etiology of allergic rhinitis in Northern Vietnam. Russian rhinology. 2019; 27(1):15-18. <https://doi.org/10.17116/rosrino20192701115>.
5. V. M. Svistushkin, G. N. Nikiforova, P. S. Artamonova, E. A. Shevchik. Modern possibilities of pathogenetic therapy of patients with allergic rhinitis. <https://doi.org/10.21518/2079-701X-2020-6-101-106>.
6. N.G. Astafieva, L.A. Goryachkina, N.I. Ilyina, L.S. Namazova, L.M. Ogorodova, I.V. Sidorenko, G.I. Smirnova, B.A. Chernyak. Allergic rhinitis. Clinical recommendations. PF_4_2008_BLOK_coll.qxd 08/19/2008 18:12 Page 81.
7. O. M. Kurbacheva, S. A. Polner, D. S. Smirnov. Allergic rhinitis. An eternal problem and its modern solution. Medical Council. No. 3 (2015) <https://doi.org/10.21518/2079-701X-2015-3-84-91>.
8. A.A. Chotchaeva, A.I. Kolotilina, I.A. Korsunsky, G.I. Smirnova, A.I. Asmanov, D.B. Moonblit. Allergic rhinitis: approaches to diagnosis and treatment. RMJ. 2018;9:22-28.
9. Yu.K. Yanov, S.V. Ryazantsev, S.A. Artyushkin, I.V. Fanta, S.S. Pavlova. Allergic rhinitis: modern aspects of therapy. Bulletin of Otorhinolaryngology, 3,2018. <https://doi.org/10.17116/otorino201883356>. 56-60.
10. P.V. Berezhansky, N.S. Tataurshchikova, A.B. Malakhov. Possibilities of early personalized diagnosis of allergic rhinitis in children. Effective pharmacotherapy. 2023; 19 (32): 16–22.
11. T.P. Markova, O.Z. Bulkina. Prevention and treatment of allergic rhinitis. RMJ. 2011;7:462.