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MODERN LABORATORY DIAGNOSTICS OF TONSILLITIS

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Abstract
Tonsillitis is an inflammation of the tonsils, often accompanied by a sore throat, difficulty swallowing and fever. This disease can be either acute or chronic, caused by a bacterial or viral infection. Scientific thought can be compared to a perpetual motion machine, which, contrary to the laws of physics, does not stop for a moment. It penetrates into the most hidden corners of the universe, expanding the boundaries of knowledge and opening new horizons. Acute tonsillitis, also known as angina, is manifested by a sharp deterioration in the condition, enlargement of the lymph nodes and the formation of purulent plugs. The chronic form is characterized by periodic exacerbations, bad breath and a feeling of discomfort in the throat.

Keywords: Tonsillitis, streptococcus, diagnostics, laboratory, pathogenesis, differential diagnostics.

Introduction

An important role is played by strengthening the immune system, maintaining oral hygiene and timely treatment of colds. In severe cases, when conservative methods are ineffective, surgical removal of the tonsils may be required — tonsillectomy. Each discovery, like a starlight, illuminates the path to the unknown, and each study becomes a brick in the foundation of human progress. Scientists, as pioneers, go forward, overcoming doubts and mistakes in order to bring to the world the truth hidden behind the veil of secrets. Science is not just a set of facts, it is a living organism that breathes, grows and evolves with us. And this is her greatest strength. Treatment depends on the cause of the disease: antibiotics are prescribed for bacterial infection, and symptomatic therapy for viral infection. The etiology of tonsillitis is associated with inflammation of the tonsils caused by infectious agents. The main pathogens are bacteria, most often beta-hemolytic streptococcus group A (Streptococcus pyogenes), as well as staphylococci, pneumococci and hemophilic bacillus. Viral infections such as adenoviruses,

influenza viruses, parainfluenza and Epstein-Barr viruses also play a significant role in the development of the disease. In rare cases, tonsillitis can be caused by fungi, such as Candida. Risk factors include decreased immunity, hypothermia, contact with infected persons, chronic diseases of the ENT organs and unfavorable environmental conditions. In children, tonsillitis is more common due to the immaturity of the immune system. Chronic tonsillitis develops with prolonged exposure to infection, impaired local immunity, and the presence of foci of chronic infection in the body. Anatomical features of the tonsils play an important role, contributing to the delay of pathogens. The relevance of tonsillitis in modern medicine is due to its widespread occurrence and significant impact on the quality of life of patients. This disease, characterized by inflammation of the palatine tonsils, occurs in both children and adults, often becoming chronic. Chronic tonsillitis can cause serious complications, including rheumatism, kidney and cardiovascular damage. The increase in antibiotic resistance and the increase in the number of atypical forms of infections complicate diagnosis and treatment. In addition, tonsillitis is often associated with immune disorders, which requires an integrated approach to therapy. The social significance of the problem is emphasized by the high frequency of temporary disability and the need for surgical intervention in some cases. Thus, the study of tonsillitis remains an important task for improving the prevention, diagnosis and treatment of this disease.

The pathogenesis of tonsillitis is a complex process caused by the interaction of infectious agents, the immune response and local inflammatory reactions. The main etiological factor is bacteria, mainly beta-hemolytic streptococcus group A, less often staphylococci, pneumococci and viruses. Pathogenic microorganisms colonize the lymphoid tissue of the tonsils, causing damage to the epithelium and activation of local immunity. In response to the invasion of pathogens, pro-inflammatory cytokines (IL-1, IL-6, TNF-α) are released, which leads to the development of edema, hyperemia, and infiltration of tissues by leukocytes. Chronic tonsillitis is characterized by prolonged inflammation, accompanied by a violation of the drainage function of lacunae, accumulation of detritus and the formation of purulent plugs. This contributes to the persistence of infection and autoimmune reactions, which can lead to systemic complications such as rheumatism, glomerulonephritis, and cardiopathy. Thus, the pathogenesis of tonsillitis is a multifactorial process that requires an integrated approach to diagnosis and treatment.

The clinic of tonsillitis is characterized by inflammation of the palatine tonsils, accompanied by sore throat, difficulty swallowing and general intoxication of the body. The disease can occur in an acute or chronic form. Acute tonsillitis, or angina, is manifested by a sharp increase in temperature to 38-40 ° C, weakness, headache and an increase in regional lymph nodes. The tonsils are hyperemic, covered with purulent plaque or plugs. Chronic tonsillitis is characterized by less pronounced symptoms: periodic sore throat, subfebrile fever, bad breath and frequent recurrence of sore throats. Complications of tonsillitis include paratonsillar abscess, rheumatism, glomerulonephritis, and damage to the cardiovascular system. Diagnosis is based on the clinical picture, pharyngoscopy data and laboratory tests. Treatment of acute tonsillitis includes antibiotic therapy, gargling, and symptomatic therapy. In the chronic form, tonsillectomy may be required. Prevention consists in strengthening the immune system, timely treatment of infections and oral hygiene.

Functional diagnosis of tonsillitis is a set of methods aimed at assessing the condition of the tonsils and their functional activity. The main approaches include visual examination, pharyngoscopy, laboratory tests (microbiological smear analysis, PCR diagnostics) and instrumental methods such as ultrasound. Visual inspection can reveal hyperemia, swelling, the presence of purulent plugs or plaque. Pharyngoscopy makes it possible to assess in detail the structure of the tonsils and surrounding tissues. Laboratory tests help determine the causative agent of the infection and its sensitivity to antibiotics. Functional diagnostics also includes an assessment of the patient's immune status, which is especially important in chronic forms of tonsillitis. Additionally, methods such as thermography or endoscopy can be used to clarify the degree of inflammation and possible complications. The diagnostic results make it possible to develop an individual treatment plan, including conservative methods or surgical intervention. Early and accurate diagnosis helps to prevent complications and improve the patient's quality of life.

Laboratory diagnosis of tonsillitis plays a key role in determining the etiology of the disease and choosing the optimal treatment strategy. The main methods are microbiological examination of a smear from the surface of the tonsils and the posterior pharyngeal wall, as well as serological tests to detect antibodies to pathogens. In bacterial tonsillitis, more often caused by beta-hemolytic streptococcus group A, an express test for streptococcal antigen and culture media is performed. In the case of the viral nature of the disease, PCR assays are used to identify viruses (for example, adenoviruses, Epstein-Barr virus). A general blood test can detect leukocytosis, increased ESR, and other markers of inflammation. Additionally, biochemical studies may be prescribed to assess the general condition of the body. An integrated diagnostic approach ensures accurate determination of the cause of tonsillitis and promotes effective treatment.

Treatment of tonsillitis requires a comprehensive approach aimed at eliminating inflammation of the tonsils and preventing complications. The basis of therapy consists of antibacterial drugs prescribed for the bacterial nature of the disease. Penicillins, macrolides, or cephalosporins are most commonly used. In the case of viral tonsillitis, antibiotics are ineffective, and treatment includes antiviral agents as well as symptomatic therapy. Local antiseptics in the form of sprays, tablets for resorption or rinses are used to relieve pain and reduce inflammation. Solutions based on chlorhexidine, miramistin or furacilin help to clear the tonsils of plaque and reduce bacterial load. An important role is played by strengthening the immune system: taking vitamins, immunomodulators and observing a gentle regime. For chronic tonsillitis, physiotherapy may be recommended, such as UV radiation or ultrasound therapy. In severe cases, when conservative methods are ineffective, surgical removal of the tonsils (tonsillectomy) is considered. However, the operation is performed only according to strict indications, as the tonsils play an important role in protecting the body from infections.

Rehabilitation of tonsillitis is a complex process aimed at restoring the functions of the tonsils and preventing recurrence of the disease. The basis for successful rehabilitation is the elimination of foci of infection, strengthening of immunity and normalization of lymphoid tissue. At the initial stage, it is important to sanitize the oral cavity and nasopharynx, including washing the tonsillar lacunae with antiseptic solutions. Physiotherapy methods such as UV

radiation, laser therapy, and ultrasound help reduce inflammation and accelerate tissue regeneration. Special attention is paid to the diet: it is recommended to exclude irritating foods, increase the intake of vitamins and minerals. Immunomodulatory drugs and probiotics help restore the natural microflora and strengthen the body's defenses. Regular gargling with herbal decoctions (chamomile, sage) and saline solutions supports hygiene and reduces the risk of reinfection. It is important to avoid hypothermia and stress, which can trigger an exacerbation. In case of chronic tonsillitis, it is recommended to see an otolaryngologist and carry out preventive treatment 1-2 times a year.

Prevention of tonsillitis includes a set of measures aimed at strengthening the immune system and preventing inflammation of the tonsils. It is important to maintain oral hygiene: brush your teeth regularly, use mouthwashers, and treat tooth decay in a timely manner. Avoid hypothermia, especially in the throat area, and dress according to the weather.

Strengthen the immune system with a balanced diet rich in vitamins and minerals. Include fruits, vegetables, herbs, and foods high in vitamin C in your diet. Regular exercise and hardening also help boost your body's defenses. Avoid contact with sick people, especially during epidemics. If necessary, use masks and antiseptics. Humidify the indoor air to avoid drying out the mucous membrane of the throat. At the first sign of a cold, start treatment to prevent the development of complications. Gargling with herbal decoctions or saline solution helps reduce the risk of inflammation. Visit your doctor regularly for routine checkups and follow his recommendations.

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