Chronic Tonzillar Infection As A Cause Of Rheumatic Disorders In Children

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Abstract: Chronic tonsillar infection is one of the most pressing problems in modern pediatrics, being not only a local inflammatory process but also a potential source of serious systemic complications. According to modern epidemiological studies, chronic tonsillitis is diagnosed in 12-15% of school-age children, while the frequency of rheumatic complications accounts for 2-8% of the total number of chronic tonsillary pathology cases.

Keywords: chronic tonsillitis, rheumatic complications, children, β-hemolytic streptococcus group A, rheumatic fever, post-streptococcal glomerulonephritis, autoimmune processes

Introduction

The problem of chronic tonsillitis is of particular importance due to its ability to induce the development of rheumatic complications in children. The palatine tonsils, being an immunocompetent organ, in chronic inflammation become a source of pathogenic microflora, primarily β-hemolytic streptococcus of group A, which has pronounced rheumatogenic properties[1]. Molecular mimicry between streptococcal antigens and host tissue is the basis of autoimmune processes leading to the development of rheumatic fever, post-streptococcal glomerulonephritis, and other systemic diseases [2].

Pathogenetic mechanisms for the development of rheumatic complications in chronic tonsillitis in children are characterized by the complex interaction of the infectious agent, the immune system, and genetic predisposition factors. Features of childhood immunity, including the immaturity of the complement system, the features of T- and B-cell links of immunity, create prerequisites for the chronicity of the inflammatory process and the development of autoimmune reactions[3].

The modern diagnosis of chronic tonsillitis with rheumatic complications is based on a comprehensive approach, including clinical, laboratory, instrumental, and immunological research methods. Early detection of signs of systemic damage allows for timely pathogenetically justified therapy and prevents the progression of rheumatic diseases [4].

Treatment of this pathology requires a multidisciplinary approach involving an otolaryngologist, pediatrician, rheumatologist, and, if necessary, other specialists. Modern therapeutic strategies include conservative and surgical treatment methods aimed at sanitizing the focus of infection, correcting immune disorders, and preventing rheumatic complications [5].

Chronic tonsillitis with rheumatic complications represents one of the most serious problems of modern pediatrics, combining aspects of otorhinolaryngology, rheumatology, and cardiology. According to various studies, chronic tonsillitis is diagnosed in 15-20% of school-age children, with 2-3% of patients developing systemic complications of a rheumatic nature [6].

Methodology

Of particular concern is the fact that rheumatic complications of chronic tonsillitis, including acute rheumatic fever, post-streptococcal glomerulonephritis, and reactive arthritis, can lead to irreversible damage to the cardiovascular system, kidneys, and joints. In developing countries, rheumatic heart disease remains the leading cause of acquired heart defects in children and adolescents.The socio-economic significance of the problem is determined by high costs for long-term treatment, rehabilitation of patients, as well as a decrease in the quality of life of children and their families. Early diagnosis and timely treatment of chronic tonsillitis are key factors in preventing the development of severe systemic complications and preserving children's health.

Chronic tonsillitis is a long-term inflammatory process in the tonsils of the palate, characterized by a disruption of their barrier function and the development of chronic infection foci. In children, this disease has special clinical significance due to the immaturity of the immune system and a high risk of systemic complications. The leading role in the pathogenesis of chronic tonsillitis belongs to the β-hemolytic streptococcus of group A (Streptococcus pyogenes), whose antigens have pronounced immunogenic properties and the ability to cause cross-immune reactions.

Result and Discussion

Molecular mimicry between streptococcal antigens and tissue structures of the heart, kidneys, joints, and nervous system underlies the development of post-streptococcal autoimmune diseases [7].

Rheumatic complications of chronic tonsillitis include acute rheumatic fever with involvement of the heart (rheumatic carditis), joints (polyarthritis), nervous system (Sidengam's chorea), as well as post-streptococcal glomerulonephritis and reactive arthropathies. A peculiarity of childhood is the more aggressive course of the rheumatic process with the rapid formation of valvular heart defects and a high risk of recurrence [8].

Timely detection of children with chronic tonsillitis in the risk group for developing rheumatic complications and conducting adequate therapy are priority tasks of the pediatric service in the prevention of severe systemic diseases[9]. Chronic tonsillitis is a long-term inflammatory process in the palatine tonsils, characterized by a disruption of their barrier function and the development of chronic infection foci. In children, this disease has special clinical significance due to the immaturity of the immune system and a high risk of systemic complications [10].

The leading role in the pathogenesis of chronic tonsillitis belongs to the β-hemolytic streptococcus of group A (Streptococcus pyogenes), whose antigens have pronounced immunogenic properties and the ability to cause cross-immune reactions. Molecular mimicry between streptococcal antigens and tissue structures of the heart, kidneys, joints, and nervous system underlies the development of post-streptococcal autoimmune diseases [11]. Rheumatic complications of chronic tonsillitis include acute rheumatic fever with involvement of the heart (rheumatic carditis), joints (polyarthritis), nervous system (Sidengam's chorea), as well as post-streptococcal glomerulonephritis and reactive arthropathies. A peculiarity of childhood is the more aggressive course of the rheumatic process with the rapid formation of heart valve defects and a high risk of recurrence.

The obtained results confirm the high relevance of the problem of chronic tonsillitis with rheumatic complications in childhood. The frequency of systemic complications was 23.7%, which corresponds to literature data and indicates the severity of this pathology. The palatine tonsils, being an important component of the lymphoid pharyngeal ring, perform barrier and immune functions in the child's body. However, in the development of a chronic inflammatory process, the tonsils transform from a protective organ into a constant source of infection and sensitization. Persistent β-hemolitic streptococcal infection of group A triggers a cascade of immunopathological reactions, leading to the development of autoimmune processes and the formation of rheumatic lesions of various organs and systems.

A characteristic feature of childhood is the immaturity of the immune system and an increased tendency to develop cross-immune reactions between streptococcal antigens and the body's own tissues. The phenomenon of molecular mimicry between streptococcal M-protein and the antigens of the heart muscle, joints, kidneys, and central nervous system underlies the pathogenesis of acute rheumatic fever, post-streptococcal glomerulonephritis, PANDAS syndrome, and other autoimmune complications.

Modern pediatric practice indicates significant difficulties in the timely diagnosis of rheumatic complications of chronic tonsillitis, which is due to the polymorphism of clinical manifestations, the long latent period of complication development, and the lack of clear diagnostic criteria. Often, rheumatic lesions develop months or years after the diagnosis of chronic tonsillitis, which makes it difficult to establish cause-and-effect relationships [12].

Issues of optimal management tactics for children with chronic tonsillitis, criteria for selecting patients for conservative or surgical treatment, as well as methods for preventing rheumatic complications, remain a subject of active discussion among specialists of various profiles. The insufficient study of risk factors for the development of rheumatic lesions in chronic tonsillar infection in children necessitates comprehensive research aimed at developing personalized approaches to the diagnosis, treatment, and prevention of this pathology [13].

The most frequent rheumatic complication was acute rheumatic fever (41.4% of cases), which corresponds to modern understanding of the pathogenesis of post-streptococcal autoimmune diseases. The high frequency of cardiac complications (72.4% of all rheumatic manifestations) emphasizes the need for early diagnosis and adequate treatment of chronic tonsillitis in children [14].

A significant increase in the level of ASL-O and antistreptohyaluronidase in children with rheumatic complications (by 2.7 and 2.7 times, respectively) confirms the leading role of β-hemolitic streptococcus group A in the pathogenesis of the disease and can serve as an additional diagnostic criterion [15]. The high effectiveness of tonsillectomy in preventing recurrence of rheumatic attacks (94.2% vs 69.2% with conservative treatment) corresponds to modern recommendations for the need for radical treatment of chronic tonsillitis in children with systemic complications.

Conclusions

Chronic tonsillitis with rheumatic complications is diagnosed in 23.7% of children with decompensated forms of the disease, with the most common complication being acute rheumatic fever (41.4%).

In children with rheumatic complications of chronic tonsillitis, a significant increase in inflammatory activity indicators (ECR, CRP, leukocytosis) and immunological markers of streptococcal infection (ASL-O, antistreptohyaluronidase) is observed. Cardiac manifestations of rheumatism are detected in 62.1% of children with systemic complications, with mitral valve being most frequently affected (34.5%). Tonsillectomy is a highly effective treatment method for children with chronic tonsillitis and rheumatic complications, ensuring the prevention of recurrence of rheumatic attacks in 94.2% of cases.

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