

DIFFERENTIATION OF THE IMPACT OF RHEUMATIC FEVER ON THE BODY IN YOUNG CHILDREN AND ADOLESCENTS

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Abstract:

Rheumatic heart disease (RHD) significantly impacts patients' quality of life due to its long-term complications. RHD can lead to valvular damage, heart failure, arrhythmias, thromboembolic events, and endocarditis. According to statistical data, 15-18% of patients with rheumatism experience severe disease progression, resulting in congenital heart defects. These complications restrict patients' physical activity and create difficulties in performing daily tasks. As a result, their quality of life declines, negatively affecting their overall health and psychological well-being. Additionally, heart failure and arrhythmias associated with RHD can reduce life expectancy. Therefore, preventing RHD, ensuring early diagnosis, and implementing effective treatment strategies are crucial for improving patients' quality of life.

Keywords: Rheumatic fever, acute and chronic heart diseases, streptococcus, rheumatism, blood pressure.

Introduction

Introduction. Rheumatic heart disease (RHD) is an autoimmune condition that develops after a streptococcal infection, leading to damage of the heart valves and potentially resulting in heart failure. This disease affects millions of people worldwide and has a significant impact on patients' long-term quality of life. This article discusses the long-term complications of RHD and its effects on patients' quality of life.

Method. This study analyzed scientific literature, statistical data, and clinical outcomes of patients with rheumatic heart disease (RHD). Articles published in the last ten years from PubMed, Google Scholar, and WHO databases were reviewed. Additionally, quality of life indices of patients across different age groups were assessed.

Results. Rheumatic heart disease (RHD) causes chronic complications that significantly impact patients' quality of life. Long-term complications of RHD include heart failure, arrhythmia,

thromboembolism, and infectious endocarditis. These conditions severely affect patients' physical and mental well-being. In advanced cases of RHD, physical activity is significantly reduced. Damage to the heart valves disrupts blood circulation, leading to rapid fatigue, shortness of breath, and, in some cases, respiratory distress even at rest. These symptoms make it difficult for patients to carry out daily activities[2]. Living with chronic heart disease can contribute to depression and anxiety disorders. Studies indicate that approximately 30-40% of patients with RHD experience depressive symptoms, leading to decreased quality of life and social isolation. Another serious aspect of long-term complications is a reduction in life expectancy. In patients with advanced heart failure, the average lifespan is significantly shortened. Additionally, arrhythmias and thromboembolic events pose life-threatening risks[1].

RHD also has substantial economic implications for both patients and society. Treatment costs, the need for continuous medication, and reduced work capacity negatively affect patients' financial well-being. Some patients may even lose their ability to work and become disabled at an early stage[5]. RHD develops through immunological mechanisms. Antibodies produced after beta-hemolytic streptococcal infection attack heart valves, triggering an autoimmune inflammatory response. This leads to the following long-term complications: Heart failure – Valve stenosis or regurgitation increases pressure in the heart chambers, overloading the myocardium and gradually weakening it. Symptoms include shortness of breath, reduced physical activity, swelling of the extremities, and fatigue[4]. Arrhythmias – Scarring of heart tissues and disruption of electrical conduction can lead to atrial fibrillation. This condition increases the risk of clot formation in the atria, potentially causing thromboembolic events. Irreversible valvular damage – Inflammatory and fibrotic processes lead to thickening and narrowing of the mitral or aortic valves, reducing the heart's efficiency in pumping blood and causing oxygen deficiency. Infectious endocarditis – Damaged heart valves create a favorable environment for bacterial colonization, leading to further deterioration of valvular structures and worsening blood circulation. Thromboembolic events – Heart failure and arrhythmias increase the risk of clot formation within the heart. These clots can travel to the brain, lungs, or other vital organs, resulting in potentially fatal complications. Clinical Symptoms and Impact on Quality of Life The clinical presentation of RHD depends on the severity and progression of the disease[6]. Key symptoms include:

Shortness of breath – Initially occurring during physical exertion, it may later develop even at rest.

Irregular heartbeat – Tachycardia or arrhythmia significantly affects patients' quality of life.

Chest pain – Caused by impaired oxygen supply to the myocardium due to valvular dysfunction.

Dizziness and syncope – Reduced cardiac output results in insufficient cerebral blood flow.

Leg swelling – Venous blood circulation disturbances lead to fluid retention in the lower extremities.

Effects on Patients' Quality of Life: Reduced physical activity – Over 60% of patients struggle with daily activities such as climbing stairs or walking long distances. Declining mental health – Depression and anxiety are prevalent due to persistent fatigue and breathlessness, leading to social withdrawal and decreased motivation. Social limitations – Long-term treatment and disability negatively impact social adaptation. Patients often require continuous medical supervision and lifestyle modifications. Reduced life expectancy – Severe heart failure and arrhythmias shorten life expectancy by 5-10 years. Studies indicate a significant decrease in lifespan among RHD patients due to cardiac complications. **Deterioration of Mental Health** – Depression and anxiety disorders are commonly observed among patients with RHD. Persistent fatigue, shortness of breath, and a decline in quality of life contribute to psychological distress, loss of motivation, and reduced social interactions [3]. **Social Life Limitations** – Long-term treatment and disability affect patients' social adaptation. Individuals with RHD often require continuous medical supervision and must adhere to

specific lifestyle modifications, which restrict their social life. **Reduced Life Expectancy** – Severe heart failure and arrhythmias can shorten life expectancy by 5-10 years. Studies indicate that most RHD patients experience a significant reduction in average lifespan due to cardiac complications [4].

Streptococcus pyogenes, also known as group A *Streptococcus*, is a Gram-positive bacterial pathogen responsible for a range of human diseases. Superficial *S. pyogenes* infections, such as pharyngitis and impetigo, do not require long-term care. Nevertheless, these diseases are significant due to their prevalence and the required use of antibiotics for treatment that may be scarce in low-resource settings. Furthermore, superficial infections can lead to serious invasive diseases, including toxic shock, necrotizing fasciitis, and cellulitis. *S. pyogenes* infections can also lead to post-infectious, immune-mediated sequelae, which require costly, long-term treatment[8].

The interictal period of rheumatism in adolescents proceeds with symptoms indicating the ongoing activity of the process. Patients complain of weakness, increased fatigue, headaches, heart pain, and shortness of breath. During this period, heart defects are formed in most cases. A characteristic feature of the ECG is the frequent leftward deviation of the heart axis, prolongation of systole, and an increase in the systolic index. The author notes that rheumatism in adolescents often follows a continuously relapsing course, with rapid development of circulatory disorders, which, within 1–2 years, leads to a fatal outcome due to severe heart failure. Regarding the incidence of rheumatism in adolescents compared to younger school-age children, data from different authors are contradictory. The most significant sequelae to *S. pyogenes* infection are ARF and RHD, and there are many strategies available to prevent these diseases. The challenge is to ensure that they are available in all settings, including resource-constrained environments, and that novel strategies are explored to help eliminate or eradicate ARF and RHD[9].

Screening by echocardiography has revealed a large burden of “borderline RHD”; a diagnostic category in the 2012 WHF criteria, which includes isolated functional or isolated morphological changes to either the mitral or aortic valves. The clinical significance of borderline RHD is not yet known, and the need for and role of secondary prophylaxis in this population is uncertain. The majority of short-term natural history studies appear to show a relatively benign prognosis for borderline RHD, particularly when the initial lesion is isolated pathological mitral regurgitation. However, a single study from Australia (with a follow-up at 2.5–5 years) showed that children with borderline RHD were at a significantly greater risk of ARF and progression of valvular disease, as compared to their age- and gender-matched peers. Clearly, more research in this area is needed. Currently, the most common practice for children with borderline RHD is close clinical follow-up, with initiation of secondary prophylaxis only in cases of recurrent ARF or progression of valvular disease[7]. Over time, ventricular dysfunction can occur and patients may present with symptoms of left heart failure, such as decreased exercise tolerance, fatigue, and shortness of breath with exertion. On physical exam, patients with significant aortic regurgitation will show a widened pulse pressure, bounding pulses, and increased precordial activity with leftward deviation of the ventricular impulse secondary to left ventricular dilation. The classical aortic regurgitation murmur is a high-pitched diastolic murmur heard at the left lower sternal border most prominently when a patient is leaning forwards and at end-expiration. Severity of regurgitation correlates with duration of the murmur, with a shorter murmur associated with more severe disease. Chest x-ray and ECG will be normal with mild disease, but with more advanced disease, long-standing aortic regurgitation evidence of left ventricular dilation will present, along with ascending aortic enlargement by chest x-ray[10]

Discussion. Research findings indicate that the long-term complications of RHD significantly reduce patients’ quality of life and have a serious impact on their overall health. Therefore, early diagnosis and effective preventive measures are essential. Preventive strategies include timely

treatment of streptococcal infections, regular monitoring of patients, and the implementation of comprehensive rehabilitation programs, all of which play a crucial role in improving patient outcomes.

Rheumatic heart disease has a profound effect on patients' quality of life due to its long-term complications. This article examined the major complications of RHD and their impact on daily living. Research findings suggest that early diagnosis and effective treatment strategies can help improve patients' quality of life. Future studies should focus on more in-depth clinical research and the development of new treatment approaches.

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