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PATHOGENESIS AND CLINICAL COURSE OF ACUTE HEART FAILURE IN PATIENTS WITH RHEUMATIC HEART DISEASE*Researcher: Boboraximov Ilhom Murodullayevich**Alfraganus University, Faculty of Medicine,**Specialty: General Medicine, 5th year student**ORCID: 0000-0002-4567-8910**E-mail: boboraximovilhom6@gmail.com**Tel: +998 97 573 98 88**Scientific supervisor: Xusanov Ravshan Axrorovich**Cardiologist, PhD**ORCID: 0000-0003-1122-3344**E-mail: xusanov1985@bk.ru**Tel: +998 90 321 74 44*

Abstract: *This article discusses the pathogenetic mechanisms of acute heart failure development in patients with rheumatic heart disease, the clinical features, and diagnostic challenges. Acute heart failure is one of the most severe complications of rheumatic valvular disease and has a direct impact on patients' quality of life and survival. Based on clinical observations and literature review, the article highlights some issues specific to medical practice in Uzbekistan.*

Keywords: *rheumatic heart disease, acute heart failure, pathogenesis, clinical course.*

INTRODUCTION

Rheumatic heart disease (RHD) remains an urgent problem in global cardiology. According to international statistics, millions of people live with valvular damage caused by rheumatic fever every year, which often leads to the development of acute heart failure (AHF) [1]. Rheumatic processes mainly affect the mitral and aortic valves, resulting in impaired hemodynamic balance between atria and ventricles [2].

AHF is one of the most severe outcomes of RHD. Its development is associated not only with mechanical stenosis or regurgitation of the valves but also with myocardial hypertrophy under excessive hemodynamic load and subsequent contractile dysfunction. This process leads to elevated left atrial pressure, pulmonary hypertension, and progressive overload of the right ventricle [3].

In Uzbekistan, the problem remains highly relevant. Unfortunately, many patients seek medical care only at advanced stages, reducing treatment effectiveness. One of the main diagnostic challenges is that symptoms may resemble other conditions, such as bronchial asthma or pulmonary diseases [2].

The aim of this article is to analyze the pathogenetic mechanisms and clinical course of acute heart failure in patients with rheumatic heart disease, as well as to highlight diagnostic challenges.

Materials and Methods

This study was conducted using a combination of literature review and clinical case analysis.

1. Literature review:

Over the past 10 years, international and local medical publications were analyzed. Databases such as PubMed, Scopus, and Google Scholar were searched using terms like “rheumatic heart disease and acute heart failure,” “pathogenesis of valvular defects,” and “clinical features of RHD”. Uzbek- and Russian-language articles were also reviewed [1], [2].

2. Clinical observations:

Medical records of patients with rheumatic valvular disease admitted to specialized cardiology centers in Tashkent over the past three years were analyzed. Patient histories, type of valve lesions, clinical manifestations of AHF, and instrumental findings (ECG, echocardiography) were assessed.

3. Analytical methods:

Descriptive statistical analysis was applied. Special attention was given to the pathogenetic factors and clinical features of AHF. The data obtained were compared with existing literature.

Results

1. Pathogenesis.

Rheumatic disease primarily affects the cardiac valves, most often the mitral and aortic valves. Valvular insufficiency leads to increased hemodynamic load between atria and ventricles, resulting in ventricular hypertrophy followed by impaired contractility.

Myocardial inflammation, fibrosis, and conduction disturbances due to rheumatic processes further accelerate the development of AHF [1].

2. Clinical course.

Clinical observations showed that in 60–70% of patients with RHD, the first signs of AHF appeared during physical exertion. The most frequent symptoms included:

- Dyspnea (82%),
- Tachycardia,

- Peripheral edema (45%),
- Paroxysmal nocturnal dyspnea.

In some cases, patients developed acute pulmonary edema and left ventricular decompensation.

3. Instrumental and laboratory findings.

Echocardiography revealed that mitral stenosis and regurgitation were the most common abnormalities. A reduced ejection fraction indicated severe AHF.

ECG findings included P-wave deformation (mitral P), atrial fibrillation, and ventricular tachyarrhythmias.

Laboratory analysis showed elevated natriuretic peptide levels and persistent inflammatory markers [2].

4. Diagnostic challenges.

In younger patients (<40 years), RHD was often diagnosed late. In the early stages, symptoms were nonspecific, and ECG/laboratory findings were insufficient for accurate diagnosis, which led to sudden development of acute heart failure.

DISCUSSION

AHF is a common complication of RHD, and its pathogenesis is based on a complex interaction of valvular dysfunction, increased hemodynamic load, and secondary myocardial impairment [1].

Literature indicates that myocardial inflammation and fibrosis in rheumatic disease contribute to reduced contractility and arrhythmogenesis [2]. Our observations confirm this, as atrial fibrillation was prevalent among patients.

Dyspnea was the leading symptom (over 80% of patients), consistent with previously reported studies [3]. However, in young patients, late presentation and misdiagnosis (e.g., as bronchitis or neurological disorders) delayed treatment. This aligns with earlier reports [4].

Another important factor is the age-related difference in risk factors. In older patients, hypertension and atherosclerosis are common contributors to heart failure, whereas in young patients with RHD, valvular lesions are the primary cause. Preventive measures should therefore focus on early diagnosis of rheumatic fever and prevention of recurrence.

Clinical vigilance is also essential. The misconception that “young patients do not have heart disease” often leads to missed or late diagnosis, increasing the risk of severe complications such as pulmonary edema, malignant arrhythmias, and sudden death [5].

Overall, both literature and clinical observations highlight that AHF in RHD is challenging to diagnose. Careful assessment of clinical symptoms,

echocardiographic and laboratory monitoring are critical. Future studies should focus on early detection of RHD in young patients and individualized treatment strategies.

CONCLUSION

1. Acute heart failure in young patients with rheumatic heart disease often develops rapidly and is associated with valvular damage, impaired myocardial contractility, hemodynamic overload, and arrhythmias.
2. Dyspnea and tachycardia are the most common initial symptoms, but diagnosis is often delayed, reducing treatment effectiveness.
3. Echocardiographic screening and vigilant clinical assessment are essential to improve early diagnosis.
4. Preventive strategies targeting rheumatic fever detection and management remain crucial to reducing the incidence of AHF.

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