



# CLINICAL AND INSTRUMENTAL FEATURES AND INFLAMMATORY BIOMARKERS IN PATIENTS WITH CHRONIC HEART FAILURE WITH PRESERVED EJECTION FRACTION

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## ABSTRACT

*Chronic heart failure with preserved ejection fraction (HFpEF) remains one of the most challenging problems in modern cardiology due to the steady increase in disease prevalence, the high frequency of comorbid disorders, and the persistent risk of adverse cardiovascular outcomes. In recent years, particular attention has been paid to the role of chronic inflammation and epicardial obesity in the development of structural and functional myocardial remodeling. An increase in epicardial adipose tissue thickness is considered a key factor in the progression of diastolic dysfunction and the reduction of exercise tolerance in patients with HFpEF.*

**Objective.** To study the clinical and instrumental features and inflammatory biomarkers in patients with chronic heart failure with preserved ejection fraction.

**Materials and Methods.** The study included 63 patients with HFpEF who were undergoing examination and treatment at the Cardiology Clinic of Samarkand and the Department of Internal Medicine at the Railway Hospital of Samarkand. The comparison group consisted of 58 patients with arterial hypertension and metabolic disorders without signs of chronic heart failure. All patients underwent a comprehensive clinical, instrumental, and laboratory examination, including assessment of hemodynamic indicators, echocardiographic parameters, epicardial adipose tissue thickness, and inflammatory biomarkers. The levels of NT-proBNP, interleukin-6, tumor necrosis factor- $\alpha$ , and high-sensitivity C-reactive protein were determined.

**Results.** The analysis showed that patients with HFpEF significantly more often experienced dyspnea on exertion, reduced exercise tolerance, and signs of chronic cardiovascular remodeling. Left ventricular hypertrophy was detected in 73.0% of the subjects, diastolic dysfunction in 82.5%, and concentric myocardial remodeling was identified in 63.5% of patients. A comparative analysis established a statistically significant increase in epicardial adipose tissue thickness in the main group patients compared to the comparison

group. The most pronounced changes were recorded in patients with an obesity phenotype and concomitant metabolic disorders.

The study of inflammatory biomarkers demonstrated a significant increase in the levels of IL-6, TNF- $\alpha$ , high-sensitivity C-reactive protein, and NT-proBNP in patients with HFpEF. It should be noted that the degree of increase in inflammatory markers was directly dependent on the severity of epicardial obesity and the duration of the disease. In patients with a disease duration of more than 10 years, inflammatory activity indicators were significantly higher compared to those with a shorter disease duration.

Correlation analysis revealed a strong relationship between epicardial adipose tissue thickness and the levels of IL-6, TNF- $\alpha$ , and NT-proBNP. A strong positive correlation was found between epicardial fat thickness and IL-6 level ( $r=0.71$ ,  $p<0.001$ ). A similar relationship was found between epicardial obesity and the level of TNF- $\alpha$  ( $r=0.64$ ,  $p<0.001$ ).

**Conclusion.** The results obtained indicate the important role of epicardial obesity and chronic inflammation in the development of clinical and functional disorders in HFpEF. The established relationships between epicardial adipose tissue thickness and inflammatory biomarkers suggest that these indicators can be considered promising criteria for the early diagnosis of disease progression.

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