



Diagnostik Role of Marker of Cystatin C in Patient with Heart Failure

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ABSTRACT: The study of marker cystatin c is an important clinical and diagnostic role that determines the processes of myocardial fibrosis and remodeling in the early stages of the diseases.

Key words: Chronic Heart Failure, Chronic Kidney Disease, Renal Dysfunction, Fibrosis Markers, Cystatin-S,

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Despite significant advances in the treatment of various cardiovascular diseases, the prevalence of chronic heart failure continues to rise. 23 million people in the world suffer from CHF. In European countries, this disease is diagnosed in 1-2.6% of the population, in the USA - 5.7 million adults over 20 years old, the prevalence is 2.2%. CHF is the main reason for inpatient treatment in 16.7% [8,12,5]. This disease is the most common reason for hospitalization among people over 65 years of age.

Moreover, about 50% of patients with CHF are re-hospitalized within 6 months, 20-25% of patients within 30 days after discharge from the hospital.

70% of readmissions are due to decompensate heart failure. In the future, due to the aging of the population, an increase in the prevalence of cardiac risk factors and an improvement in the survival of patients with various cardiovascular pathologies, a further increase in the number of patients with CHF is expected [15,7,9]. By 2030, an increase in the number of patients with CHF by 46% is predicted.

In this regard, the objectives of healthcare are to significantly improve the quality of medical care for patients with CHF, prevent the progression of the disease and disability, improve the quality and increase life expectancy.

Currently, the search and study of new biological markers of CHF are relevant, which can be a useful tool for monitoring the effectiveness of pharmacotherapy, early diagnosis of the disease, prognosis of its clinical outcomes and play an important role in risk stratification of patients [11,18,6]. To date, only one CHF biomarker, brain natriuretic peptide, is widely used in clinical practice. (BNP)

The latter is secreted by ventricular cardiomyocytes in the form of a prohormone and already in the bloodstream is split into a C-fragment in a ratio of 1:1

Determination of the level of BNP and NT -proBNT is used for screening asymptomatic ventricular dysfunction, diagnosis and prognosis of CHF, assessment of the effectiveness of therapy. In this regard, it seems relevant to search for new CHF biomarkers that can compensate for these shortcomings.

In recent years, certain data have been accumulated on the prognostic role of the cystatin -C marker in patients with cardiovascular disease.

Cystatin C is a 13 kDa protein that belongs to the family of competitive inhibitors of the lysosomal cysteine protease and is synthesized at a constant rate in all nuclear cells [13,16,19]. Due to the free filtration of cystatin C in the glomeruli, complete reabsorption and catabolism in the proximal tubules, and the absence of tubular secretion, the plasma concentration of this protein is considered to be completely dependent on GFR.

Recent studies have shown, however, that plasma cystatin C concentrations are affected by age, body mass index, sex, smoking, and high concentrations of C - reactive protein. It has been demonstrated that determining GFR in patients with CKD using an equation that takes into account cystatin C values is more accurate, if the above parameters are included in the calculation [21, 14,17].

In recent years, attention has been paid to cystatin C as a potential marker of cardiovascular risk [1, 20]. The authors studied the relationship between cystatin C levels and the presence of cardiovascular risk factors in 3241 participants in the Framingham off spring study cohort.

In this cohort of patients, renal function was assessed using the MDRD equation. The authors showed that even in individuals without CKD or microalbuminuria, high levels of cystatin C were independently associated with cardiovascular risk factors such as age, female sex, high body mass index, low HDL cholesterol, and smoking [10,22,3]. Analysis of data in individuals with CKD revealed a similar risk profile, but study participants with high cystatin C concentrations without CKD had a higher predisposition to obesity and hypertension than those with CKD and low cystatin C values [2,3,4]. These data support earlier findings from the Third National Review of Health and Nutrition Research.

In conclusion, an increase in cystatin C concentration is presumably a marker of chronic kidney disease and cardiovascular risk. If this is confirmed, the role of cystatin C as an early sensitive marker of kidney function would have important clinical implications. Large, well-designed prospective studies in patients without renal dysfunction are needed to fully elucidate the association between high cystatin C concentrations and cardiovascular risk. Thus, further study of early markers in the prediction of heart failure seems to be quite reasonable and promising.

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