

Innovations in the Diagnosis and Treatment of Chronic Heart Failure

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Abstract: Heart failure is a typical clinical accompanied by symptoms syndrome (e.g. shortness of breath, ankle swelling and fatigue) that lead to structural or functional abnormalities of the heart (e.g. high venous pressure, pulmonary edema and peripheral edema). In recent years, the significant role of B-type natriuretic peptide has been revealed in the pathogenesis of heart disease and the use of the drug sacubitril/valsartan has started. It has a positive effect on the regulation of the level of B-type natriuretic peptide in the body. It is obviously seen from the the world literature that natriuretic peptides play an important role in the pathophysiology of heart failure. For this reason, many studies suggest that the importance of natriuretic peptides in the diagnosis and treatment of heart failure is recommended. Due to this, we tried to investigate the effects of a comprehensive medication therapy with a combination of sacubitril/valsartan in the patients with chronic heart failure.

1. Introduction

Heart failure is a major public health problem in the world due to a high risk and mortality rate, in addition to its high cost, which is widespread across the world, leading to worsening of patients' health often.

The prevalence of disease varies depending on age, for example, in developed countries the number patients with heart failure is 1-2% of the population under 70 and 10% and more of the population over 70 years.

In addition, ejection fraction of the left ventricle is normal in one sixth of the 65-year-old population applying to a physician for complaints of bruising during a physical activity.

1.1 Diagnosis of chronic heart failure patients can be made in the following order:

Thus, a clinical history is first investigated to assess the likelihood of heart failure in patients with suspected heart failure. For this purpose, history of coronary artery disease (MI, revascularization), history of arterial hypertension, radiation or cardiotoxic drug use, diuretics use, orthopneum, paroxysmal nocturnal dyspnea is investigated. In the second stage, physical examinations are conducted and the following cases are investigated: age-related creaks, bilateral heel dislocations, noises, enlargement of the venous veins, and displacement or expansion of the peak. BNP and NT-proBNP are checked in the case of any suspicious signs. Before instrumentation examinations ECG is done. If the results of the laboratory results are normal, the patient may not have any heart failure. If the results of laboratory tests are high or changes in ECG screening are detected, the ECHO is recommended. It is possible to determine the diagnosis after the ECHO examination.

Chronic heart failure is classified according to the index of ejection fraction of left ventricular in the literature of recent years. In the 2016 ESC Guidelines, it is classified as heart failure with preserved left ventricular ejection fraction (LVEF>50%), normal left ventricular ejection fraction (LVEF 40-49%) and reduced ventricular ejection fraction

(LVEF<40%). Thus, 2016 ESC Guidelines indicate that such a classifications of HF patients based on the LVEF is of paramount importance in achieving the response to the chosen treatment method.

Modern principles of current conservative treatment are based on the pathogenetic conception of CHF as a result of long-term activation of the neurohumoral system. This includes primarily renin-angiotensin-aldosterone and sympathetic-adrenal systems, which are considered to be highly pathogenic in patients with chronic heart failure with poor prognosis. Theoretically, the combined use of different groups of neurohumoral modulators may provide additional benefits as a result of more complete blockade of neurohormones in the treatment of patients with chronic heart failure. The essence of this concept is quite simple, the more the different levels of neurohumoral regulation are blocked, the better the outcome.

Thus, it is high time that ACE inhibitors has been the main drug regulating the activity of RAAS components, which has not only improved the clinical course of the disease but also improved the prognosis for patients with CHF. The mechanism of action of ACE inhibitors has been widely studied in recent years. ACE inhibitors has dual blockade: the formation of angiotensin II (AII) and the breakdown of bradykinin, which acts through nitric oxide and vascular prostanoids. It has also been found that ACFI is unable to adequately regulate RAAS activity during long-term use, even with their maximum dosage use.

Currently, a new drug, an inhibitor of neprilysin-the sacubitrile molecule is being widely used in the treatment of CHF. Angiotensin-converting enzyme inhibitors or angiotensin receptor blockers can be replaced by an optimal dose of angiotensin receptor neprilysin in the treatment of II-III functional class (NHYA) heart failure and chronic symptomatic patients with sufficiently high blood pressure. In this case, the angiotensin receptor neprilysin inhibitor should not be given within 36 hours after the last dose of the angiotensin-converting enzyme inhibitor.

It is noted that the degradation of NPs, bradykinin and other peptides slows down while inhibiting neprilysin. High-dose

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A (ANP) and B (BNP) natriuretic peptide type form physiological effects by interacting with NP-receptors and increasing cGMP levels, thereby increases diuresis, sodium, myocardial release and anti-remodeling. Both ANP and BNP inhibit renin and aldosterone secretion. Affected RAAS reduces vasoconstriction, sodium and water retention in the body and myocardial hypertrophy.

Thus, a detailed study of the Paradigm-Hf study showed that the sacubitril/valsartan combination had a positive effect in the treatment of patients of chronic heart failure with low ejection fraction. Many studies have been conducted on the study of this new drug, and the research in this series is still ongoing. In Paradigm-HF study, one of these studies, it is found out that conservative treatment with the addition of sacubitril/valsartan is more beneficial than the treatment with enalapril and increasing the level of endogenous natriuretic peptides reduces relapse and mortality rate in patients of heart failure with low ejection fraction.

It is studied that the combination of sacubitril/valsartan reduces not only the risk of death, but also the symptoms of heart failure and the physical constraints caused by the disease. In reducing the risk of mortality and re-hospitalization in the patients with heart failure, the effect of sacubitril/valsartan is higher than that of enalapril, angiotensin receptor. In comparison with enalapril, the majority of the beneficial effects of sacubitril/valsartan in relation to cardiovascular death are at least as large as the effect of enalapril in the treatment of placebo. This result is a strong evidence that co-inhibition of angiotensin receptor and neprilysin is better than inhibition of renin-angiotensin system in chronic heart failure patients.

According to a study published in 2016, concurrent blockade of the renin-angiotensin-aldosterone system with long term activation of natriuretic peptide system can also provide high therapeutic results in the treatment of HFrEF patients.

1.2 Resume

Thus, it is found out in the world literature that the methods involving all pathogenic adhesions (SAS, renin-angiotensin-aldosterone, natriuretic peptide) have been extensively studied in the treatment of HFrEF patients. Complex conservative treatment, including sacubitril/valsartan has also been investigated extensively in recent years.

2. Conclusion

The use of a complex conservative treatment method, which is incorporated with the sacubitril/valsartan molecule, plays a very important role in the treatment of heart failure.