

# A Survey of the Literature on Traditional and Modern Treatments for Chronic Heart Failure

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## Abstract

Chronic heart failure (CHF), which frequently affects a large portion of the global population, frequently progresses to a life-threatening condition, and has a high mortality rate, is another significant global public health issue. The most recent developments in the treatment of CHF patients whose left ventricular ejection fraction (LVEF) is less than 40% interest us. In recent years, cardiac disease etiology has been linked to BNP. Since sacubitril and aspirin, an angiotensin receptor neprilysin inhibitor, were part of a complex medical treatment plan for CHF patients, we decided to investigate their effects. In addition, we looked into the treatments, particularly cardiac resynchronization therapy, that were used to treat these patients with the device. Last but not least, we compared the outcomes of cardiac resynchronization therapy to those of a sophisticated medical treatment plan that included sacubitril and valsartan, both of which are angiotensin receptor neprilysin inhibitors.

**Keywords:** Chronic heart failure • Neprilysin • Inhibitor/Sacubitril • Valsartan • Cardiac resynchronization therapy

## Introduction

Common symptoms (such as dyspnea, heel swelling, and fatigue) and signs of structural or functional heart problems (such as elevated intravascular venous pressure, pulmonary edoema, and peripheral edoema) make up the clinical syndrome of heart failure. Every year, this number rises worldwide for a variety of reasons. Malnutrition, obesity, and the annual rise in diabetes mellitus are among these factors. Others include an increase in alcohol consumption, smoking, high blood pressure, and smoking cigarettes [1].

The pathophysiology of chronic heart failure includes a complex array of circulatory and neurohormonal system issues that contribute to the onset of stationary symptoms. The vasodilator and vasoconstrictor neurohormonal systems are in balance in generally healthy individuals. In the pathophysiology of chronic heart failure, a variety of circulatory and neurohormonal system issues play a role in the onset of stationary symptoms. In generally healthy individuals, the vasodilator and vasoconstrictor neurohormonal systems are in balance. The activity of natriuretic peptides, particularly BNP, causes numerous significant effects on the heart and kidney. Reduced arterial blood pressure, vasodilation, increased diuresis and natriuresis, increased soft tissue filtration, decreased renin and aldosterone secretion, antihypertensive and antifibrotic effects, lipolysis, and mitochondrial biogenesis are among the organism's physiological effects of natriuretic peptides [2,3].

## Literature Review

Atrial natriuretic peptide (ANP), which is essentially held in atrial pellets as a propeptide, is released into the bloodstream in response to atrial tension. B-type natriuretic peptide is also present in atrial pellets, but only when the heart is actively pumping blood; in the ventricle, it also reaches high concentrations. These situations occur the most frequently in patients with congestive heart failure. According to a James L. Januzzi paper on the natriuretic peptides,

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BNP and pro-BNP have recently gained significant medical significance. In the process of diagnosing and evaluating heart failure, a significant role is played. Consequently, BNP and NT-pro BNP tests are currently used to evaluate individuals with HF, whether it has been demonstrated or suspected [4].

With the development of natriuretic peptide assays, these important biomarkers have begun to be recognized as biological mediators of the cardiovascular system. Current clinical treatments for assessing heart failure patients' diagnoses and prognoses. The procedure for evaluating and diagnosing heart disease has typically evolved in tandem with the BNP and pro-BNP. In addition, this article demonstrates that incorporating BNP as a therapeutic objective to enhance heart failure care may alter contemporary cardiology. Another article in this field demonstrates the significance of measuring natriuretic peptide and using it in conjunction with echocardiography to evaluate clinical symptoms in patients with dyspnea to diagnose heart failure (HF). The plasma concentration of each patient is a reflection of their current hemodynamic status and a forecast of their subsequent clinical outcomes following an accurate diagnosis [5].

In this meta-analysis, 15263 test results from coronary studies were used. The diagnosis of heart failure is only accepted in 40–50 percent of cases because it is generally difficult to make. The collection of the patient's medical history, clinical examinations, and traditional examinations (chest x-ray, etc.), as well as the measurement of plasma natriuretic peptide levels, were found to be important factors in the diagnosis of heart failure in numerous studies. Increases the number of symptom diagnoses that are accurate. As a result, the most recent international guidelines for the diagnosis and treatment of heart failure recommend that these markers be used during the diagnosis process. The obesity pandemic is the primary driver of global morbidity and mortality increases. Risk factors for these conditions include obesity, hyperlipidemia, left ventricular hypertrophy, arterial hypertension, and diabetes. The likelihood of developing chronic heart failure is raised by these symptoms. The available data points to a connection between BNP and NT-proBNP and the body mass index. Increased body weight has a negative impact on BNP and pro-BNP levels. A decrease in NP levels results in heart failure. In another study, the prevalence of pre-diabetes in HFrEF patients and its effects on disease progression were investigated. 8399 patients were observed during this investigation. During this trial, it was discovered that the DAFUC patients had severe dysglycemia, which frequently results in unpleasant cardiovascular events. Patients with pre-diabetes had more complications than those with 6.0% HbA1c during the study. In terms of effectiveness, sacubitril/valsartan outperformed enalapril in none of the patients' glycemic conditions [6-8].

Diabetes and heart failure are significant modern epidemics. Despite the fact that diabetes is thought to be a risk factor, very little research has looked at the relationship between diabetes and heart failure. In a 2018 study, the use of sacubitril and valsartan to treat sleep apnea syndrome in patients with

chronic heart failure was examined. In these patients, sleep apnea is a fairly common co-morbidity that can influence the development of chronic heart failure in a negative way. 76% of HFrEF patients may experience breathing difficulties during sleep. The best way to treat sleep apnea in people with chronic heart failure is still up for debate. Zaca carried out one of these studies in 2018. For the purpose of comparison, HFrEF patients in this study received either an ICD or sacubitril/valsartan. It is now known, as a result of this trial, that sacubitril/valsartan extends life at a lower cost than an ICD, resulting in the conclusion that medical treatment is more financially feasible. Therefore, the results of the model indicate that, in HFrEF patients, sacubitril/valsartan prolongs life at a lower cost than ICD. In addition, sensitivity analysis demonstrates that economic valsartan and sacubitril work well in the majority of the situations analysed [9].

## Discussion

In addition to the medication, the device treatment for chronic heart failure is very advanced. Both cardiac defibrillator implantations and cardiac resynchronization therapy have become increasingly popular in recent years. ICDs are mostly used to stop heart rate decline and the problems that go along with it, which is known as bradycardia. Additionally, these devices reduce ventricular arrhythmia issues, which are thought to be potentially fatal complications, effectively. As a result, although some antiarrhythmic medications can lower the risk of sudden death and mortality, they cannot lower the overall mortality rate. Negative side effects that exacerbate the condition are possible on occasion with these medications. In some situations, implantation of an ICD may be used. However, serious patients who are not expected to survive more than a year should not be given an ICD. This course of treatment has no effect on them in any meaningful way. The goal of the ICD implantation, the implantation procedure, the potential complications (primarily inappropriate shocks) associated with the device's activation, and the circumstances in which the device must be removed or cancelled (terminal status, infection, left ventricle rehabilitation) should all be made clear to the patients for whom this course of treatment is recommended in advance. Another type of device therapy is heart resynchronization therapy. The data in this area also show that cardiac resynchronization therapy improves heart activity, symptoms, and overall patient condition in appropriately selected patients and lowers mortality and relapse rates [10].

## Conclusion

In order to treat HFrEF patients, both device therapy and complex conservative treatment strategies like sacubitril/valsartan (SAS, renin-angiotensin-aldosterone, natriuretic peptide) have been extensively researched. However, there aren't many studies that have compared these treatments. Patients undergoing CRT may suffer trauma or complications related to surgery, so it is recommended that they be informed in advance. People who receive this kind of care must also stop working, even for a short time. People who receive this kind of care must also stop working, even for a short time. Additionally, CRTs are significantly more costly than standard treatment. Sacubitril/valsartan-based complex pharmaceutical therapy may be less expensive financially and may improve functional class performance without harming patient complaints. The economy and health both benefit from it.

## Acknowledgement

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## Conflicts of Interest

None.

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