

# To explore the micro-connection between the theory of "seeking the root of disease" in traditional Chinese medicine and BNP in the prevention and treatment of chronic heart failure

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**Abstract:** Chronic heart failure is one of the most common cardiovascular diseases in clinical practice, with high morbidity and poor prognosis. However, the cure rate of modern medicine has limitations, so exploring the prevention and treatment of heart failure with traditional Chinese medicine has become a contemporary hotspot. Since ancient times, Chinese medicine has had the treatment concept of "seeking the root of the disease", which has guiding significance for the treatment of heart failure. Many studies have found that the level of BNP is related to the TCM syndrome of heart failure. This article attempts to explore the possible micro-connection between the theory of seeking the basics of treatment and BNP in the treatment of chronic heart failure from the perspective of microscopic syndrome differentiation of traditional Chinese medicine. Distinctive advantages in the treatment of chronic heart failure.

**Keywords:** treatment aiming at its root causes; heart failure; BNP

Chronic heart failure (CHF) is a group of clinical disorders caused by initial myocardial damage (myocardial infarction, hemodynamic overload, inflammation, etc.) from any cause, resulting in changes in myocardial structure and function, leading to ventricular filling and ejection disorders. syndrome. It is the final destination of most cardiovascular diseases and the main cause of death for patients [1]. Relevant reports point out[2,3]: The prevalence of heart failure in the Chinese population is 0.9% (0.7% in males, 1.0% in females), and the incidence rate is 0.7‰~0.9‰. There are 4.5 million heart failure patients every year. There are about 500,000 new-onset heart failure patients, posing a huge challenge to people's health. B-type natriuretic peptide (BNP) is a polypeptide containing 32 amino acids, which is mainly synthesized and secreted by cardiomyocytes. Its appearance improves the diagnosis rate, treatment rate and prognosis of heart failure. The theory of "seeking the root of disease" is a unique treatment concept proposed by traditional Chinese medicine, that is, balancing yin and yang, treating diseases based on syndrome differentiation, and strengthening the righteous and eliminating pathogenic factors. In the early stage of chronic heart failure, the lesions are reversible to a certain extent, and BNP is the most sensitive key indicator of heart failure and has clinical predictability. Therefore, BNP has become a research hotspot of various scholars in recent years. BNP can produce certain positive effects in the evolution of heart failure. Diagnosis and treatment. Based on the understanding of the theoretical connotation of traditional Chinese medicine, the author found that the effect of BNP in heart failure has a subtle connection with it, so as to further explore the feasible ideas of traditional Chinese medicine for prevention and control of heart failure under BNP, in order to prevent and treat heart failure with traditional Chinese medicine. Exhaustion provides a certain theoretical basis.

## 1. The ideological connotation of seeking the fundamentals of TCM treatment

"Treating the root of the disease" is the main treatment idea of traditional Chinese medicine, which means that in the treatment of diseases, the pathogenesis should be reviewed in time, and the treatment should be based on syndrome differentiation to prevent the further transmission and development of the disease. "Plain Questions: Yin and Yang Yingxiang Great Theory" says: "Yin and Yang are the way of

heaven and earth, the outline of all things, the parent of change, the origin of life and death, and the house of the gods. The cure must be based on the origin." Change follows the principle of unity of opposites of yin and yang. Therefore, when doctors clinically diagnose and treat diseases, they must look for the root of yin and yang of disease changes. Just as Zhang Zhicong's "The Emperor's Neijing Suwen Collection Notes" said: "The root is also rooted in yin and yang. The viscera, qi and blood of human beings, both outside and inside, up and down, all belong to yin and yang; and external prostitution, wind, cold, heat and dampness, also belong to the forty-five elements. The two qi of yin and yang; as for the smell of curing diseases, use the needle to the left and right, diagnose the color pulse, and guide the higher and lower. After the concept of "basic", seeking the basics in treating diseases has become the most basic concept of treatment in Chinese medicine. Although physicians in the past dynasties have different understandings and expressions of the specific meaning of "ben", for example, Zhu Danxi's "Danxi Xinfu" believes that "it is not separated from the two evils of yin and yang", Zhang Jiebin's "Jingyue Quanshu" believes that the root is the six changes of cold, heat, deficiency and reality inside and outside. However, Li Zhongzi's "Must Read in Medicine" thinks that it is based on the spleen and kidney, and others have different understandings such as kidney yin and kidney yang, and spleen and stomach. From the perspective of TCM clinical practice, pathogenesis is TCM's understanding of the nature of disease, including factors such as etiology, disease nature, disease location, and the relationship between evil and righteous, as well as pathogens, constitution, and body reactivity. refer to. However, TCM's understanding of pathogenesis can be summarized as yin and yang, so there is an inherent and inevitable connection between pathogenesis-based and yin-yang-based, and cannot be treated completely separately. Generally speaking, seeking the root of a disease is to seek the root of the syndrome based on dialectics, and to grasp the essence of the syndrome [4]. With the continuous innovation, inheritance and development of traditional Chinese medicine, the idea of seeking the basis of disease treatment has gradually matured, which coincides with the etiological treatment and individualized treatment in modern clinical practice. All are to find the cause in time when the disease appears, and to formulate a corresponding treatment plan according to the different conditions of the individual. More and more scholars' treatment concept for heart failure is also approaching the strategy of "treating the symptoms in a hurry, curing the root cause" and "adapting measures to individual conditions". The key period to prevent the deterioration of heart failure focuses on the early stage of heart failure, but the clinical manifestations of patients at this stage are not typical, and the condition is easily ignored, but it is reversible and is a turning point in preventing the deterioration of heart failure. The widespread popularization of vascular knowledge, the in-depth development of the screening work of "prevention of three highs" and the continuous improvement of modern inspection methods have implemented the idea of attaching importance to cardiovascular diseases to a certain extent, and provided more treatment measures for "heart failure", but there is still a need for We explore on a large scale, and on the basis of the idea of seeking the root of the disease, we give full play to the advantages and characteristics of traditional Chinese medicine and seek new targets for treatment.

## 2. BNP and heart failure

Heart failure is a pathological state in which the heart cannot supply the corresponding blood flow required for tissue metabolism. In heart failure, when there are hemodynamic factors such as impaired myocardial ejection function and/or ventricular overload, the body can temporarily maintain cardiac function through Frank-Starling mechanism, neurohumoral mechanism and myocardial hypertrophy. relatively normal state. But extremes meet, and as the disease progresses and intensifies, the heart will eventually be in a stage of decompensation. In the process of myocardial compensation, a series of corresponding pathophysiological changes occur in each myocardial cell and cytoplasm, namely ventricular remodeling. After remodeling, the heart will lose normal ejection function and diastolic dysfunction, and eventually progress to refractory end-stage heart failure. A series of complex neurohumoral regulators are also involved in the pathological process of heart failure, especially BNP. B-type natriuretic peptide, also known as brain natriuretic peptide, reflects systolic and diastolic function in patients with HF. Since its inception, it has attracted the attention of medical scholars from all walks of life. It is one of the most important clinical indicators for judging heart failure (CHF) and other cardiovascular diseases. The sensitivity of diagnosing heart failure can reach more than 90%. prevention and other fields. BNP or NT-proBNP is mainly regulated by the expression level of BNP gene, and directly enters the blood after being secreted and produced by cardiomyocytes. The BNP gene is mainly activated after the myocardium is stretched, and related studies have pointed out that the stretch force on the myocardium is considered to be the most important stimulating factor for the production of BNP [5]. The size of the traction force is related to the volume load or pressure load of the left ventricle. At the same time, BNP may also be affected by age, gender, renal function, etc. There is more evidence that the

increase of blood BNP level is closely related to the severity of left ventricular injury [6]. Therefore, the level of BNP can change with the change of ventricular wall tension, and has a negative feedback regulation effect on it. When heart failure occurs, ventricular wall tension increases, and BNP secretion increases significantly. The degree of increase is positively correlated with the severity of heart failure. Some studies have pointed out that after discharge, patients with heart failure who have decreased plasma BNP levels are more likely to be readmitted and die than those with elevated levels. The number of people decreased significantly [7, 8]. Therefore, it can be used as an important reference data for assessing the severity of heart failure and prognosis of rehabilitation.

The diagnosis of clinical heart failure should be made by comprehensive medical history, symptoms, signs and auxiliary examinations. And symptoms and signs are the key to early detection of heart failure. However, there is no clear correlation between the severity of symptoms and the degree of cardiac insufficiency. Objective examination and evaluation of cardiac function are required. At this time, BNP determination is extremely important for the diagnosis of heart failure, and can help identify the cause of dyspnea. Important indicators in diagnosis, patient management, and risk assessment of clinical events. A normal BNP level in untreated patients can basically rule out the diagnosis of heart failure, and a high BNP level in treated patients indicates a poor prognosis.

### 3. The micro-connection between the theory of seeking the root of disease and BNP

Seeking the root of disease is a wise coping strategy of traditional Chinese medicine for the occurrence of disease. It contains two meanings, one is to treat according to syndrome differentiation, and the other is to strengthen the righteousness and eliminate pathogenic factors, and balance yin and yang. Based on the reversibility of heart failure outcomes and the guidance and prediction of BNP, with the help of modern pathophysiological theory, combined with microscopic syndrome differentiation of traditional Chinese medicine, it is believed that there may be a certain microscopic relationship between BNP and the occurrence and development of heart failure, and early intervention with early BNP lesions as the breakthrough point, it can be regarded as a feasible strategy to prevent and treat malignant heart events.

1) Treatment based on syndrome differentiation, strengthening the righteousness and eliminating evil spirits and BNP

Syndrome differentiation and treatment is a prerequisite for the treatment of chronic heart failure. As Qin Bowei [9] said: "Whoever uses syndrome differentiation and treatment according to the theory of Chinese medicine will have good results. Those who do not use syndrome differentiation and treatment according to the theory of Chinese medicine will have poor effect." According to the clinical symptoms of heart failure, most Chinese medicine books attribute it to the categories of cardiac paralysis, convulsions, palpitations, edema, asthma syndrome, and chest paralysis [10, 11]. There is no name for "heart failure" in ancient Chinese medicine books. According to the more common clinical symptoms and signs of patients, such as palpitation, shortness of breath, lower limb edema, etc. In the categories of "edema", the external causes include wind, cold, dampness, heat, and pathogenic poisons, and the internal causes are emotional disorders, unclean diet, labor and rest, and visceral diseases. In the pathogenesis of heart failure, heart qi deficiency is the foundation, heart yang deficiency is the sign of the disease development, and heart and kidney yang deficiency is the critical stage of the disease syndrome; while blood stasis and water stasis are the inevitable pathological products of heart failure. "Plain Questions Commentary on Fever Diseases" says: "Where evil is gathered, its qi must be deficient." Evil flourishes, and it accumulates over time, which accelerates the consumption of righteous qi and causes "deficiency". From the perspective of macroscopic syndrome differentiation in traditional Chinese medicine Deficiency of righteousness is the root of the pathogenesis of heart failure, and the prosperity of evil is its target, and the deficiency of righteousness creates conditions for the invasion and spread of evil.

The course of chronic heart failure can last for several years or even decades. During this period, the state of fighting between good and evil exists for a long time. Righteousness is equivalent to the protective barrier of the human body. the key. "When it is in its position, it is positive, if it is not in its position, it is evil." As a balance index to maintain ventricular wall tension, normal BNP is similar to the normal state of human beings to a certain extent; while for "evil", it can be considered as abnormal ventricular wall tension Product of negative feedback of changes in ventricular filling pressure. In the early stage, through a series of compensatory mechanisms, it can be connected with the excessive yang transformation and insufficient yin transformation of traditional Chinese medicine. However, these mechanisms will eventually lead to decompensation, causing ventricular remodeling, and then

myocardial fibrosis. The increase of myocardial fibrosis will lead to a decrease in ventricular compliance, and the remodeling will become more obvious, and the myocardial contractility cannot exert its proper ejection effect. , forming a vicious cycle that eventually leads to an irreversible terminal stage. This process has commonalities with the development of heart failure in traditional Chinese medicine. In the early stage of heart failure, the main symptoms of heart failure are deficiency of heart qi and heart yang, deficiency of heart qi, and inability to transport blood, which leads to the dysfunction of lungs governing qi, regulating breathing, and the dysfunction of the chaobai meridians, so it can also be combined with lung qi deficiency. Deficiency; as the disease progresses, the heart is weak in blood circulation, and blood stasis is endogenous; in the middle stage, as the damage to the heart yang increases, the heart is the yang in the yang, which affects the generation of the spleen yang. In the later stage, it can further affect the kidney yang. Kidney yang is the root of the yang of the whole body. In addition, the kidney and bladder are external and internal, so water and drinking can be flooded. To sum up, the pathogenesis of heart failure can be summarized by deficiency, blood stasis and water. Blood stasis comes from qi deficiency, water is generated from yang deficiency; blood stasis benefits qi deficiency, and water floods yang, which is more damaging, which forms a vicious circle in the pathogenesis of heart failure. In recent years, many scholars have found that BNP is closely related to TCM syndrome types in patients with heart failure. For example, Zhao Jinlong et al [12] selected 140 people to study the association between TCM syndromes of chronic heart failure and BNP, including 117 cases in the experimental group and 23 cases in the control group. It can be seen from the results that the level of BNP in CHF patients was significantly higher than that in the control group. Its level is related to the heart and lungs in the early stage, the heart and spleen in the middle stage, and the heart, spleen and kidneys in the late stage. Therefore, it can be concluded that BNP can provide a clinical reference value for TCM syndrome classification. Dou Ronghai[13] also concluded through research that BNP increases gradually with the progression of heart failure patients, and the "duration of disease" has an impact on TCM syndrome types. And .BNP showed a gradually increasing trend with the gradual progress of TCM syndromes. Huang Biquan [14] and others believed that: the NT-proBNP levels of CHF syndromes are significantly different, which can be used as an important reference index for CHF TCM syndrome differentiation. To sum up, it can be seen that there is an inseparable relationship between the TCM syndrome types of heart failure and the BNP level ratio, which is worthy of our in-depth discussion.

#### 4. Correlation between traditional Chinese medicine treatment of heart failure and BNP

With the continuous development of traditional Chinese medicine, the efficacy of traditional Chinese medicine in preventing and treating heart failure has become increasingly prominent, and the regulatory effect of traditional Chinese medicine on BNP levels has attracted much attention. Yang Bo et al[15] divided the patients with chronic heart failure into 30 cases of treatment group and 30 cases of control group according to the principle of random allocation. The course of treatment is 4 weeks. The observation results after 4 weeks showed that the plasma BNP levels in the two groups after treatment were significantly lower than those before treatment; and the BNP level in the treatment group was significantly lower than that in the control group, but there was no statistical significance between the two ( $P > 0.05$ ). Therefore, it can be concluded that BNP can be used as one of the clinical basis for judging the severity of heart failure; Baoxin Mixture has significant therapeutic effect on chronic heart failure, and can be safely used in clinical practice.

To sum up, it can be seen that the important role of traditional Chinese medicine in the treatment of heart failure cannot be ignored. Modern medicine mainly focuses on symptomatic treatment and prevention of disease progression in the treatment of heart failure. However, the actual clinical effective treatment rate is far lower than the expected effective treatment rate. . At this time, the influence of traditional Chinese medicine is particularly huge. Traditional Chinese medicine in the treatment of heart failure has the advantages of high safety, less side effects, and protecting the body's righteousness. It is expected to become a new safe and effective prevention and treatment method to block and reverse the malignant progression of heart failure in the future.

#### 5. Summary and Outlook

With the popularization of cardiovascular disease and the improvement of people's awareness of self-care, there have been some breakthroughs and progress in the prevention of heart failure, but it is far from enough. The prevention and treatment of heart failure is still a major guarantee to avoid sudden cardiac death. In the prevention and treatment of heart failure, the idea of "seeking the root of the disease"

in traditional Chinese medicine needs to run through the whole process. BNP is a specific and sensitive indicator of ventricular dysfunction and is closely related to the process of heart failure. There is a microscopic relationship between the dynamic changes of levels and the classification of TCM heart failure syndrome types. It provides a certain theoretical basis for traditional Chinese medicine to prevent and treat heart failure by regulating the level of BNP and maintaining the homeostasis of the body. However, the related research on BNP in traditional Chinese medicine is still in its infancy and lacks sufficient evidence. The mechanism of action, the choice of traditional Chinese medicine or compound, the use of internal or external treatment, the exact curative effect, etc., are all problems that we must face in the prevention and treatment of heart failure, and we need to further study.

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