

# Research Progress on the Combination of Traditional Chinese Medicine and Western Medicine for the Treatment of Ischemic Cardiomyopathy

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**Abstract:** *Ischemic cardiomyopathy (ICM) refers to contractile left ventricular dysfunction in the case of severe coronary stenosis, which is the most common cause of heart failure. In recent years, the incidence of ICM has shown a significant upward trend, and the quality of life and life safety of patients have been seriously affected. At present, the treatment of ICM mainly focuses on dilating blood vessels, diuresis, improving myocardial metabolism and enhancing myocardial function. Research shows that traditional Chinese medicine has unique advantages in improving the prognosis and quality of life of ICM patients. There are a variety of treatment methods, including decoction, injections, proprietary Chinese medicine, etc. This article summarizes the research progress of ICM's traditional Chinese medicine, western medicine and integrated traditional Chinese and western medicine, with a view to providing reference for clinical treatment.*

**Keywords:** Integration of traditional Chinese and Western medicine, Ischemic cardiomyopathy, Research progress.

## 1. Introduction

Ischemic cardiomyopathy (ICM) is a concept proposed by Burch et al. [1] in 1970 for patients with clinical manifestations such as coronary artery disease, heart enlargement and congestive cardiomyopathy. It refers to atherosclerosis, Coronary artery spasm or microcirculation changes cause coronary artery stenosis or occlusion, resulting in long-term ischemia and hypoxia in the heart muscle, resulting in the loss of myocardial cells, scar tissue replacement, decreased cardiac contractile function or diastolic function change, and eventually causing heart failure [2]. Commonly used clinical therapeutic drugs include diuretics, beta-receptor blockers, angiotensin-converting enzyme inhibitors, angiotensin II receptor blockers and angiotensin receptor encephalophinase inhibitors, etc. Non-drug treatments include blood transport reconstruction (CABG, PCI, etc.), stem cell therapy and heart transplantation, etc. Research shows [3] that ICM has become one of the main causes of death for patients with cardiovascular diseases. It is more likely to be in middle-aged and elderly people. The older you are, the higher the morbidity, disability rate and mortality rate. Epidemiological research results show [4] that the number of ICM patients worldwide is 26 million. ICM has a poor prognosis, and its 5-year mortality rate is 50% to 84; if there is significant cardiac enlargement, especially for those with progressive cardiac enlargement, the mortality rate within 2 years can reach 50% [5].

## 2. Cognition of ICM in Traditional Chinese Medicine

### 2.1 Etiology and Pathogenesis of Traditional Chinese Medicine of ICM

According to the clinical manifestations of ICM, it can be classified as "chest paralysis" and "heartache" in traditional Chinese medicine. In the *JinGuiYaoLve*, there is a special article on "chest paralysis and heartache", which believes that

"yang micro-yin string" (yang qi decline, yin and cold inner prosperity) is the main pathogen, and there are descriptions of symptoms such as "water stops under the heart, even palpitation, and micro-term shortness of breath" and other symptoms, that is, yang deficiency does not turnify water, or feels cold and dampness to cause stopping drinking, causing water to be cold inside, and above the heart and become sick. The *ZaBingYuanLiuXiZhu* pointed out: "The seven emotions are caused by heartache, and the seven emotions imbalance can cause qi and blood consumption, heart failure, paralysis and heartache." Pointing out emotional factors can cause heartache. *RenzhaiZhiZhiFangLun* pointed out: "The reason for the seriousness of the heart is caused by wind-cold evil qi, and the cause is caused by qi, blood, phlegm and water, then it is painful." It clearly points out that wind-cooled evil qi, qi, blood, phlegm and water are the causes of heart disease. The *ShengjiZongLu* pointed out that "the viscera are weak, and the cold is the guest", believing that the heartache is caused by the feeling of the external cold on the basis of the deficiency of the viscera. Huang Ruixia and others [6] believe that the pathosis of this disease is old and weak, lack of positive qi, and weak to promote. If the qi is not good, the blood is not good, which leads to blood stasis and disease, and advocates the method of benefiting qi and promoting blood circulation. Professor Zhou Yabin believes that this disease is caused by blood stasis caused by unfavorable qi deficiency and blood circulation. If gasification is unfavorable, water is produced. Blood and water are both yin, and the two affect each other. Therefore, using the theory of qi, blood and water to treat this disease has achieved good curative effect [7]. Xiong Shangquan's team referred to a number of literature and materials combined with clinical research to form a standardized "Guidelines for Clinical Diagnosis and Treatment of Traditional Chinese Medicine for Ischemic Cardiopathy". The syndrome is divided into phlegm and blood stasis syndrome, qi deficiency and blood stasis syndrome, qi and yin deficiency and blood stasis syndrome, and yang deficiency water and blood stasis syndrome. Qi deficiency and blood stasis syndrome is more common in the early stage of ICM. Patients with qi and yin deficiency and

blood stasis have a longer course of disease. Yang deficiency and water blood stasis syndrome are mostly the advanced syndrome type of ICM, and the phlegm and blood stasis syndrome is the only symptom that is mainly manifested by empirical evidence [8].

## 2.2 Traditional Chinese Medicine Treatment of ICM

### 2.2.1 Make up for the weak

After middle age, the righteousness and self-deficiency, the heart's qi and yang deficiency, and the heart's qi, blood, yin and yang disorders caused by cold evil, diet, emotions and other factors, and finally have symptoms of deficiency syndrome. Through clinical research, it can be seen that tonic methods are often tonifying qi, and also to warm yang, nourish yin and nourish blood. (1) Buyi heart and qi: Tonifying heart and qi is the basic law of ICM treatment. In most cases, it is combined with other treatment methods, but there are also reports of single-use qi tonic method, which is common in the clinical application of extracts of qi tonic drugs. Li Yumei [9] treated ICM patients with astragalus polysaccharide injection. After treatment, the cardiac function was significantly enhanced, with an efficiency of 97.4%. Experimental studies have shown that astragalus injection has a significant inhibitory effect on ventricular remodeling and myocardial cell autophagy in ICM rats, which may be mediated by calumenin [10]. (2) Wenyang Yiqi method: Wenyang Yiqi method is one of the common treatment methods of ICM. Modern pharmacological research has found that Yiqi medicine itself has a strong heart effect. It is matched with Wenyang medicine, and the synergistic effect of the two can make the heart-strength effect more significant. Zhang Li [11] used Wutou Chishizhi decoction to treat patients with ICM with heart failure. The clinical efficiency of the test group was 93.3%, better than 78.33% of the control group. The level of vascular endothelial growth factor (VEGF) in the test group was higher than that of the control group, and the serum high-sensitivity C-reactive protein (hsCRP) and troponin I (cTnI) was lower than that of the control group, indicating that the effect of Wutou Chishizhi decoction combined with Western medicine to treat ICM with heart failure was accurate, which may be related to reducing the level of inflammatory factors and improving myocardial contractility.

### 2.2.2 Shi will be diarrhea

In the course of the onset of ICM, blood stasis, phlegm drinking, water stop, qi stagnation, cold coagulation and other evil block the meridians. If the meridians are not open, it often manifests as pain, heart failure and other symptoms. The methods of invigorating blood, qi and dissolving phlegm are often used, among which the method of activating blood and dissolving stasis is the most common, and the clinical dosage form is mainly traditional Chinese medicine injection. (1) Blood circulation and blood circulation method: Blood ecchymosis runs through the entire pathogenesis of ICM, so the method of promoting blood circulation and blood circulation is often used in clinic to treat the disease. Chen Meng, an early scholar [14], used the method of promoting blood circulation and remove blood clots (rhubarb, Sanqi, Chuanxius, Danshen, peach kernel, safflower, licorice) to

treat ICM, which can effectively improve 6 min walking test distance (6MWT) and BNP levels. In addition, traditional Chinese medicine injections containing Danshen ingredients are often used for treatment in clinic. For example, tanshinone IIA sulfonate injection, Danhong injection, Danshen polyphenolate injection have been reported to increase ICM left ventricular ejection function and improve patient symptoms [15]. Pharmacochemical studies [16] show that the active ingredients of Salvia elixir have anti-inflammatory, antioxidant, anti-fibrosis and protective effects on the heart muscle. (2) The method of activating blood and qi: Qi stagnation and blood stasis is one of the important pathogenic factors of this disease. Qi is the commander of blood, and qi is blood circulation, and qi helps to activate blood. The research report [17] shows that on the basis of conventional Western medicine treatment, the treatment of Xuanparalysis and stasis (astragalus, Yanhuso, sandalwood, Sichuan astragalus, etc.) is used to treat ICM with chronic heart failure, which can significantly reduce the patient's chest tightness, chest pain and other symptoms, improve clinical efficacy, reverse the patient's ventricular reconstruction, and improve the blood lipid metabolism function. Yuan Hui et al. [18] Treating ICM patients with soothing liver and beneficial prescriptions (Chaihu, Salvia miltiorrhiza, white ginseng, Fabanxia, melon scutellaria, almonds, Huanglian, Poria, Yanhusuo, liquorice) can effectively reduce the level of serum hyaluronic acid (HA) and type III precollagen (PCIII) and improve myocardial fibrosis in patients. There have also been studies [19] confirming the efficacy of Salvia miltiorrhiza ligustrazine injection in the treatment of ICM, and there are few adverse clinical reactions. (3) Clearing heat and removing phlegm: Research report [20], the mechanism of internal phlegm obstruction syndrome of coronary heart disease involves regulating microcirculatory function and improving blood clotting status.

### 2.2.3 Gong and supplement both

Clinically, cardiovascular diseases are often mixed with virtual and real [21]. As a special type of treatment for coronary heart disease, this disease often adopts the treatment method of both supplement, and Gong + supplement. Among them, the method of benefiting qi and promoting blood circulation is the most common, and a variety of Chinese propried medicine involves this method. (1) Beneficial for qi and blood: Research reports show that the method of benefiting qi can enhance myocardial contractility, and the method of activating blood can improve the state of blood rheology, reduce the preload, which is conducive to the improvement of symptoms. The combination of the two is more effective. Research by Chi Zengxin et al. [22] found that Tongxinluo capsule combined with Fosimpril to treat ICM can effectively improve the clinical symptoms, inflammatory response and blood lipid levels of patients. Wu Baoli [23] used astragalus ginseng gas drops to treat patients with ICM accompanied by heart failure. The LVEDD in the observation group was significantly lower than that of the control group, and LVEF and 6MWT were significantly higher than those in the control group ( $P < 0.05$ ). (2) Benefiting the temperature and yang, activating blood and water: Hu Rongquan et al. [24] used heart vein injection to treat ICM. After 3 months, the heart-thoracic ratio and reactive oxygen decreased, the serum total antioxidant capacity was enhanced, and the superoxide

dismutase increased, suggesting that it had a positive impact on the level of oxidative stress. Compared with conventional Western drugs, systematic evaluation and research shows that Qiqi Qiangxin Capsule is more conducive to improving the functional status of ICM patients as a whole, improving their athletic ability and improving their quality of life [25]. (3) Wenyang Lishui: Wenyang Lishui is a common treatment for ICM with heart failure and edema. Wenyang Tongluo Decoction (astragalus, safflower, osmanthus branches, aconite, dried ginger, Zelan, Poria, Scape, etc.) can effectively reduce TCM syndrome points and improve cardiac function, with a total efficiency of 94.23% [26]. (4) Invigorating qi and nourishing yin and activating blood: relevant studies [27] show that there is a strong correlation between the TCM syndrome type of coronary heart disease and cardiac function, among which patients with qi and yin deficiency syndrome have the worst cardiac function, so some clinical Chinese patent drugs are based on benefiting qi and nourishing yin and promoting blood Heart-preserving mixture can significantly improve cardiac function, improve myocardial microcirculation, improve quality of life, and reduce the rate of rehospitalization in patients with ischemic cardiomyopathy and heart failure [28]. When treating patients with ICM and atrial atrial arrhythmia, stable heart particles can improve cardiac function, reduce P-wave dispersion and BNP levels, and increase 6MWT [29].

### 3. Combined Treatment of Traditional Chinese and Western Medicine

#### 3.1 Traditional Chinese Medicine Decoction Combined with Western Medicine Treatment

Decoction is the most commonly used traditional Chinese medicine in clinic. It has the characteristics of simple operation, fast effect, easy to absorb, and can be added or subtracted with symptoms. Xue Qiu and others [30] Treat ICM with warm kidney and blood-activating prescriptions (conite, cinnamon, Shengdi, astragalus, angelica, Panax notoginseng, Poria, Zexie, tangerine peel, scorice) combined with salcoubal valsartan to significantly reduce the level of NT-proBNP, reduce the walking test distance of 6 minutes, improve the left ventricular ejection fraction, and promote the improvement of patients' cardiac function. A randomized controlled study carried out by Li Yan [31] found that the basic treatment of Western medicine combined with Qiting Yixin Decoction (Astragalus, Scape, licorice, Osmanthus Branch, Poria, Chuanxiong, Maidong, Angelica, Dangsheng, Salvia miltiorrhiza) can significantly reduce the level of NT-proBNP, matrix metalloproteinase-9 (MMP-9) and galactose lectin 3 (Gal-3), and consider the possibility of protecting myocardial cells in patients with ICM heart failure, inhibiting ventricular remodeling and improving cardiac function. Yuan Hui et al. [32] treat ICM patients with liver-reducing and heart-reducing prescriptions (Chaihu, Dan ginseng, white ginseng, Fa Banxia, melon, yellow astragalus, almond, Huanglian, Poria, Yanhuso, licorice) combined with Western medicine conventional therapy, which can effectively reduce the level of type III pre-collagen (PC III) and serum hyaluronic acid (HA) and inhibit the heart Muscle fibrosis, improve heart function.

#### 3.2 Traditional Chinese Medicine Injection Combined

#### with Western Medicine Treatment

Traditional Chinese medicine injection, or traditional Chinese medicine injection, is the product of the combination of clinical injection technology of Western medicine and traditional Chinese medicine decoction. It not only inherits the characteristics of multiple targets and components of traditional Chinese medicine, but also has the advantages of fast effect, convenient operation and high bioavailability in clinical practice. Traditional Chinese medicine injections containing astragalus and salvia miltiorrhiza are most commonly used in clinical treatment. Li Yumei [9] was treated with astragalus polysaccharide injection combined with conventional Western medicine (antiplatelet, diuresis, etc.) for ICM patients. Compared with simple Western medicine treatment, combined with astragalus polysaccharide injection can effectively enhance cardiac function. Experimental studies have shown that [10] Astragalus injection may mediate ventricular remodeling and myocardial cell autophagy in ICM rats through reticular calcium binding protein (calumenin), improving cardiac function and reducing myocardial pathological damage. Zheng Li et al. [33] randomly divided 93 ICM patients into the control group and the observation group. Both groups were treated with enapril. On this basis, the observation group combined with Salvia miltiorrhiza polyphenolic acid. Results The observation group could effectively inhibit the levels of inflammatory factor monocyte chemokine protein-1 (MCP-1), CRP and MMP-9 compared with the control group, and improve the left ventricular ejection fraction. The difference was statistically significant ( $P < 0.05$ ). Research by Zhao Chunli et al. [34] shows that Dan Shenchuanazine injection combined with levocarnitine to treat ICM heart failure can effectively reduce inflammatory reactions, stabilize myocardial cells, and improve patients' heart function. Meng Jing et al. [35] reviewed the pharmacological effect and clinical research on the injection of Yiqi Fumai (freeze-dried) and found that Yiqi Fumai injection can effectively inhibit ventricular reconstruction, improve myocardial ischemia and reperfusion damage, and improve the heart function and symptoms of patients with ICM with heart failure.

#### 3.3 Traditional Chinese Medicine Combined with Western Medicine Treatment

Proprietary Chinese medicine is more effective than traditional Chinese medicine. It has small adverse reactions, is easy to carry, is more convenient to take every day, and is more acceptable to patients clinically. A clinical study report shows that [36] Qiqiangxin Capsule combined with Ivabrai treats patients with low adverse reactions in ICM, which can reduce serum inflammatory factor levels, regulate autonomic nerve function, relieve myocardial ischemia, and improve myocardial damage. Bao Lina [37] uses Qi ginseng Yiqi drops combined with conventional Western medicine to treat patients with ICM with heart failure. It has a remarkable effect, which can effectively reduce serum Gal-3 and sST2 levels, delay myocardial fibrosis, inhibit ventricular reconstruction, improve the patient's heart function, improve clinical symptoms, and reduce the re-hospitalization rate of patients. Zhu Xueli et al. [38] randomly divided 96 ICM patients into two groups. The control group was routinely treated with Western medicine. On this basis, the observation group was

treated with Kangdaxin oral liquid. Results, the observation group's NT-proBNP, fibrosis indexes (HA, PIIINP, LN and Col-IV) were further lower than that of the control group ( $P < 0.05$ ), indicating that Kangdaxin oral liquid may improve the cardiac function of ICM patients by inhibiting myocardial fibrosis. Sun Xiaojiao [39] treated patients with ICM with atrial arrhythmia with stable particles and nicodil. After treatment, the LVEDD, LVESD levels and P-wave dispersion in the study group were lower than those in the control group, and the LVEF level and 6MWT distance were higher than that in the control group ( $P < 0.05$ ).

#### 4. Summary

To sum up, the combination of traditional Chinese medicine and the conventional treatment of Western medicine has significant advantages in improving cardiac function of ICM patients, reducing clinical symptoms, reducing adverse reactions, and promoting long-term good prognosis. The combination of traditional Chinese and Western medicine not only prolongs the life length of ICM patients, but also improves the quality of life and mobility of patients.

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