# Clinical Efficacy and Cardiac Function Analysis of Zhigancao Decoction Combined With Metoprolol in the Treatment of Coronary Heart Disease Arrhythmias

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**Abstract:** Objective: To explore the clinical effect and cardiac function of moxibustion licorice decoction combined with metoprolol in the treatment of coronary heart disease arrhythmia. Method: 92 patients with coronary heart disease and arrhythmia admitted from January 2022 to December 2023 were selected as the analysis subjects. Divide into a control group and an observation group using envelope randomization method. The former is treated with metoprolol, while the latter is treated with moxibustion licorice soup and metoprolol. Compare clinical efficacy, cardiac function, heart rate variability, and adverse reactions. The total effective rate of the observation group treatment was 95.65%, which was higher than that of the control group 82.61% ($x^2$=4.039, $P$=0.044); The LVESD and CO levels in the observation group were lower than those in the control group, while the LVEF and LVEDD levels were higher than those in the control group ($P$<0.05); The number of atrial premature beats and ventricular premature beats at 24 hours in the observation group was lower than that in the control group, and the levels of SDNN and SDANN were higher than those in the control group ($P$<0.05); The incidence of adverse reactions in the observation group was 6.52%, which was lower than that in the control group ($x^2$=4.389, $P$=0.036). Conclusion: For patients with coronary heart disease and arrhythmia, moxibustion with licorice decoction combined with metoprolol has a clear effect, can improve heart function, reduce myocardial contractility, and is relatively safe.
***Keywords*:** coronary heart disease and arrhythmia; moxibustion licorice soup; metoprolol; clinical effects; cardiac function

## 1. Introduction

Coronary heart disease is a common cardiovascular disease, commonly seen in middle-aged and elderly people. Patients may experience symptoms such as angina and arrhythmia, and in severe cases, it can seriously threaten their life safety. Given the severity of coronary heart disease arrhythmias, timely and effective scientific treatment measures are crucial after the disease occurs. Metoprolol is commonly used in clinical practice for treatment, which has a certain therapeutic effect and can alleviate the symptoms of patients. However, studies have shown that as the duration of metoprolol treatment prolongs, patients are prone to a series of adverse reactions, and a safer and more effective treatment plan should be chosen. Traditional Chinese medicine believes that the pathogenesis of arrhythmia in coronary heart disease is the loss of nourishment in the heart meridian and insufficient heart qi. Its treatment should be based on the principles of calming the heart and calming the mind, supplementing qi and nourishing blood. Moxibustion Gancao Tang is a classic clinical formula with rigorous compatibility. It has the effects of nourishing yin, restoring meridians, nourishing qi and blood, and is a classic formula for treating heart diseases such as arrhythmia. Qin Shiwei [3] pointed out that Moxibustion Gancao Tang is a classic formula with the effect of nourishing the heart meridian, promoting the recovery of heart function in patients, and has high safety. In view of this, the aim of this study is to explore the clinical effect and cardiac function of moxibustion licorice decoction combined with metoprolol in the treatment of coronary heart disease arrhythmia. 92 patients with coronary heart disease arrhythmia admitted from January 2022 to December 2023 were selected, and two treatment plans were provided to explore and analyze the treatment effect. The specific explanation is as follows.

## 2. Materials and Methods

### 2.1 General information

A total of 92 patients with coronary heart disease and arrhythmia were included and admitted between January 2022 and December 2023. Divide into a control group and an observation group using envelope randomization method, with 46 cases in each group. In the control group, there were 25 males and 21 females; Age 50-78 (65.41 ± 2.39) years old; The course of the disease is 1-14 (6.06 ± 0.56) months. Observation group, with 27 males and 19 females; Age 50-80 (65.72 ± 2.48) years

old; The course of the disease is 1-13 (6.01 ± 0.45) months. Two sets of data, balanced and comparable (P>0.05).

## 2.2 Inclusion and Exclusion Criteria

Inclusion criteria: ① Conforming to diagnosis [4], confirmed through physical signs, electrocardiogram, and other examinations; ② Age ≥ 50 years old; ③ The patient is conscious and able to think independently; ④ The archival materials are true and complete; ⑤ Patients and their families are informed about the study and sign a consent form.

Exclusion criteria: ① Acute myocardial infarction; ② Severe renal dysfunction; ③ Allergy to therapeutic drugs; ④ Recent treatment with other medications; ⑤ Immunological deficiency; ⑥ Refuse to participate or withdraw midway.

## 2.3 Methods

After admission, both groups of patients received routine treatment, including antihypertensive and lipid-lowering treatments.

The control group was treated with metoprolol (Shijiazhuang Yiling Pharmaceutical Co., Ltd., National Medical Standard H20065355, 25mg * 20 tablets) orally, 25mg/dose, bid.

The observation group was treated with moxibustion licorice decoction combined with metoprolol (the same as the control group). The prescription of moxibustion licorice decoction was 50g of raw rehmannia root, 12g of moxibustion licorice root, 10g of dried asparagus and hempseed, 9g of ginger and peeled cinnamon twigs, 6g of ginseng and ass hide glue, and 10 red dates. Symptomatic adjustment: For those with insufficient heart qi, increase the dosage of moxibustion licorice and ginseng; For those with insomnia, increase the amount of sour jujube kernels and cypress kernels; For those with yang deficiency, cinnamon twigs replace cinnamon; For those with edema and oliguria, add Poria cocos. Close ass hide glue, add 500mL of water to all medicines, boil them in water, 1 dose/time, take 300mL of juice, and take it warm in the morning and evening.

Both groups were used consecutively for 2 months.

## 2.4 Observation indicators

Clinical efficacy: Based on the improvement of arrhythmia symptoms and the improvement rate of traditional Chinese medicine syndrome scores, it can be divided into significant improvement (≥ 70%), effective (significant reduction, 30-69%), ineffective (no significant change, <30%), and the total effective rate is the sum of the first two.

Cardiac function: Detection of LVEF, LVESD, LVEDD, CO levels using M-mode ultrasound. Time: before and after treatment.

Heart rate variability: detected by 24-hour dynamic electrocardiogram, including premature beats, SDNN, and SDANN. Time: before and after treatment.

Adverse reactions: nausea, vomiting, loss of appetite, hypotension, sinus bradycardia, with a total incidence rate of the sum of four factors.

## 2.5 Statistical processing

SPSS 25.0 processes data, including count and measurement data, described using (%) and ($\bar{x} \pm s$), and tested using $x^2$ and *t-tests*. $\alpha$= 0.05, $P$<0.05, indicating differences in data.

# 3. Results

## 3.1 Comparison of clinical efficacy between two groups

The control group was 82.61% (38/46), while the observation group was 95.65% (44/46). The observation group was higher than the control group ($x^2$=4.039, $P$=0.044), as shown in Table 1.

**Table 1. Comparison of clinical efficacy between two groups [n (%)]**

| Group | Example count | Significant effect | Effective | Invalid | Total effective |
|---|---|---|---|---|---|
| Control group | forty-six | 16 (34.78) | 22 (47.83) | 8 (17.39) | 38 (82.61) |
| Observation group | forty-six | 18 (39.13) | 26 (56.52) | 2 (4.35) | 44 (95.65) |
| $x^2$ | - | - | - | - | four point zero three nine |
| $P$-value | - | - | - | - | zero point zero four four |

## 3.2 Comparison of heart function between two groups

Before treatment ($P$>0.05); After treatment, the LVESD and CO levels in the observation group were lower than those

in the control group, while the LVEF and LVEDD levels were higher than those in the control group ($P$<0.05), as shown in Table 2.

**Table 2. Comparison of cardiac function between two groups ( $\bar{x}$ ± s)**

| Group | Example count | LVEF (%) | | LVESD (mm) | | LVEDD (mm) | | CO (L/min) | |
|---|---|---|---|---|---|---|---|---|---|
| | | Before treatment | After treatment | Before treatment | After treatment | Before treatment | After treatment | Before treatment | After treatment |
| Control group | forty-six | 38.56 ± 2.59 | 48.52 ± 2.39* | 46.52 ± 5.28 | 41.53 ± 5.29* | 63.58 ± 5.59 | 48.69 ± 5.45* | 3.56 ± 0.51 | 4.37 ± 0.49* |
| Observation group | forty-six | 39.04 ± 2.43 | 56.42 ± 2.67* | 47.04 ± 5.32 | 36.25 ± 5.43* | 62.18 ± 5.41 | 53.26 ± 5.42* | 3.49 ± 0.48 | 3.68 ± 0.53* |
| *T*-value | - | zero point nine one seven | fourteen point nine five two | zero point four seven one | four point seven two four | one point two two one | four point zero three three | zero point six seven eight | six point four eight three |
| *P*-value | - | zero point three six two | <0.001 | zero point six three nine | <0.001 | zero point two two five | <0.001 | zero point five zero zero | <0.001 |

Note: Compared to before treatment, * $P$<0.05

## 3.3 Comparison of heart rate variability between two groups

Before treatment ($P$>0.05); After treatment, the number of atrial premature beats and ventricular premature beats at 24 hours in the observation group was lower than that in the control group, and the levels of SDNN and SDANN were higher than those in the control group ($P$<0.05), as shown in Table 3.

**Table 3. Comparison of heart rate variability between two groups ( $\bar{x}$ ± s)**

| Group | Example count | Number of premature atrial contractions within 24 hours (times) | | Number of premature ventricular contractions within 24 hours (times) | | SDNN (ms) | | SDANN (ms) | |
|---|---|---|---|---|---|---|---|---|---|
| | | Before treatment | After treatment | Before treatment | After treatment | Before treatment | After treatment | Before treatment | After treatment |
| Control group | forty-six | 302.53 ± 50.23 | 243.45 ± 20.48* | 1598.64 ± 50.45 | 1265.83 ± 50.49* | 87.65 ± 5.42 | 121.63 ± 5.96* | 83.25 ± 5.45 | 101.53 ± 5.64* |
| Observation group | forty-six | 303.96 ± 50.45 | 125.69 ± 20.47* | 1596.59 ± 50.54 | 911.53 ± 50.32* | 87.94 ± 5.36 | 139.74 ± 5.86* | 83.76 ± 5.51 | 126.53 ± 5.68* |
| *T*-value | - | zero point one three six | twenty-seven point five eight three | zero point one nine five | thirty-three point seven one zero | zero point two five eight | fourteen point six nine five | zero point four four six | twenty-one point one eight three |
| *P*-value | - | zero point eight nine two | <0.001 | zero point eight four six | <0.001 | zero point seven nine seven | <0.001 | zero point six five six | <0.001 |

## 3.4 Comparison of adverse reactions between two groups

The control group was 21.74% (10/46), while the observation group was 6.52% (3/46). The observation group was less than the control group ($x^2$=4.389, $P$=0.036), as shown in Table 4.

**Table 4. Comparison of adverse reactions between two groups [n (%)]**

| Group | Example count | Nausea and vomiting | Loss of appetite | Low blood pressure | Sinus bradycardia | total |
|---|---|---|---|---|---|---|
| Control group | forty-six | 2 (4.35) | 4 (8.70) | 3 (6.52) | 1 (2.17) | 10 (21.74) |
| Observation group | forty-six | 1 (2.17) | 0 (0.00) | 2 (4.35) | 0 (0.00) | 3 (6.52) |
| $x^2$ | - | - | - | - | - | four point three eight nine |
| *P*-value | - | - | - | - | - | zero point zero three six |

# 4. Discussion

In recent years, with the change of people's lifestyle, the increase of life pressure, and the change of population structure, the incidence rate of coronary heart disease has increased, and then the incidence rate of arrhythmia has also increased significantly. Due to insufficient coronary perfusion, the patient's heart pumping function is affected, causing compression pain and fatigue behind the sternum. If the patient's condition is not timely controlled, it can increase the risk of arrhythmia

and even sudden cardiac death. Antiarrhythmic drugs are commonly used in the drug treatment of patients with coronary heart disease and arrhythmia. Although they can alleviate clinical symptoms, they can increase the incidence of arrhythmia. With the increase of drug dosage, it can increase the burden on the heart and seriously threaten the patient's life safety.

Metoprolol genus β Receptor blockers, selective binding β Adrenergic receptors, upon entering the human body, lower the levels of catecholamines in the body, improve cardiac output, and thus correct arrhythmias [6]. In addition, metoprolol can also delay atrioventricular excitation conduction, promote improvement in blood supply status, and thus achieve the goal of alleviating symptoms. However, long-term use of metoprolol can easily lead to adverse reactions in patients, thereby affecting clinical efficacy. In traditional Chinese medicine, coronary heart disease and arrhythmia belong to the categories of "palpitations" and "chest obstruction", which belong to the syndrome of deficiency of both qi and blood, and obstruction of heart meridians. The treatment should follow the principles of promoting blood circulation and removing stasis, nourishing the heart and calming the mind. In Moxibustion Gancao Tang, raw Rehmannia glutinosa and roasted licorice are the main medicines. The former nourishes blood and stimulates the meridians, while the latter calms palpitations and restores the meridians, nourishing yin and nourishing blood. It can remove the heart vessels, such as asparagus, hemp seed and ass hide glue, which can nourish the heart and calm the nerves. Ginger and peeled cinnamon twigs are adjuvants that can promote blood circulation. The combination of various medicines complements each other and has the effects of nourishing yin, tonifying qi, promoting blood circulation, and removing blood stasis. Jujube and ginseng nourish qi and nourish blood. Roasted licorice is a medicinal herb that blends various herbs and has effects such as invigorating the heart yang and unblocking the heart meridians. This study showed that the total effective rate of treatment was 95.65% in the observation group compared to 82.61% in the control group ($P<0.05$), which is consistent with the study by Pan Zhimei [8]. Tip: Combination therapy significantly improves clinical efficacy.

Patients with coronary atherosclerosis increase vascular permeability, resulting in insufficient myocardial perfusion, which leads to myocardial ischemia and hypoxia symptoms. Cardiac function indicators can reflect the clinical symptoms of patients, and common indicators include LVEF, LVESD, LVEDD, CO, etc. Metoprolol can reduce myocardial oxygen demand, improve cardiac pumping function, and thereby increase LVEF levels [9]. In Moxibustion Gancao Tang, total flavonoids of licorice are the effective ingredients of Moxibustion Gancao, which have the effects of anti myocardial ischemia and protection against myocardial contraction. Gingerol is the main component of ginger and can effectively reduce platelet aggregation. Cinnamaldehyde is the main component of Cinnamomum cassia, which has the effect of unblocking meridians. The combination of various drugs and their interaction can improve myocardial function, lower heart rate, and ultimately increase LVEF levels. This study showed that the LVESD and CO levels in the observation group were lower than those in the control group, while the LVEF and LVEDD levels were higher than those in the control group ($P<0.05$). Tip: It can improve the patient's heart function. This study also showed that the number of atrial premature beats and ventricular premature beats at 24 hours in the observation group was lower than that in the control group, and the levels of SDNN and SDANN were higher than those in the control group ($P<0.05$). Tip: It can improve heart rate variability. Meanwhile, the incidence of adverse reactions was lower in the observation group than in the control group ($P<0.05$), which is consistent with the study by scholar Liang Cuimei [10]. Tip: Combination therapy has high safety and will not increase adverse reactions. However, the specific molecular mechanism is not yet clear and further in-depth research is needed.

In summary, the combination of Moxibustion Gancao Tang and Metoprolol is effective in treating patients with coronary heart disease and arrhythmia. It can significantly improve the patient's heart function and heart rate variability, with fewer adverse reactions and higher safety.

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