ORIGINAL RESEARCH

# Clinical Value of Heart Qi in the Treatment of Chronic Heart Failure With Depression

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## ABSTRACT

**Context** • Chronic heart failure (CHF) is a form of persistent heart failure. If a patient develops depression, it can worsen the severity of heart failure and can lead to adverse outcomes. No researchers have studied the effects of tonic heart qi soup for patients with CHF and depression.

**Objective** • The study intended to evaluate the clinical efficacy of tonic heart qi soup in the treatment of chronic heart failure (CHF) for patients with comorbid depression.

**Design** • The research team performed a prospective randomized controlled trial

**Setting:** The study took place in the Department of Chinese Medicine at Cangzhou Central Hospital in Cangzhou, Hebei Province, China.

**Participants** • Participants were 120 patients with CHF at the hospital as inpatients or outpatients between January 2016 and January 2019.

**Intervention** • The research team divided participants into two groups, with 60 patients each: (1) an intervention group, which received conventional Western medical treatment combined with treatment with a commercial tonic heart qi soup and (2) a control group, which received conventional Western medical treatment only.

**Outcome Measures** • The research team measured: (1) treatment efficacy, (2) cardiac function, (3) adverse reactions, (4) B-type natriuretic peptide (BNP) and Ghrelin, and (5) depression.

**Results** • In the intervention group, 55 participants showed significant improvement in the degree of heart failure, for a total effectiveness rate of 91.67%, which was significantly higher than that of the control group ($P$ = .000). The intervention group had 10 participants in class II, 18 in class III, and 22 in class IV. Among them, 28 participants improved, indicating significantly better outcomes than those of the control group. The intervention group's BNP levels, at 1031.58 ± 118.83 pg/ml, and ghrelin levels, at 481.46 ± 57.53%, were significantly lower than those of the control group. No liver- or renal-function damage, insomnia, or significant adverse reactions occurred for either group. The intervention group's total incidence rate for adverse reactions, at 1.67%, was significantly lower than that of the control group, at 11.67% ($P$ = .000) and also had a higher total effective rate in reducing depression, at 86.67%, compared to that of the control group, at 43.33%.

**Conclusions** • Heart Qi Tonic Tang, as an adjunctive therapy, significantly improved outcomes for CHF patients with depression. It effectively reduced heart failure symptoms, with minimal adverse reactions and increased patient comfort and compliance. (*Altern Ther Health Med.* [E-pub ahead of print.])


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Heart failure is damage to the heart muscle that conditions such as myocardial infarctions, cardiomyopathy, hemodynamic overload, and inflammation can cause.[1] This damage causes changes in the heart muscle's structure and function and ultimately leads to ventricles with a poor pumping or filling function. The disease's main clinical manifestations are dyspnea, fatigue, and fluid retention.[2] If a patient develops depression, it can worsen the severity of heart failure and can lead to adverse outcomes.

Chronic heart failure (CHF) is a form of persistent heart failure that can be stable, worsening, or compensatory. CHF represents a marked decrease in myocardial systolic function, resulting in decreased cardiac output and accompanied by an increase in left ventricular end-diastolic pressure (LVEDP) and clinically induced lung congestion and inadequate peripheral circulation perfusion, or a combination of congestion and inadequate perfusion to varying degrees.[3]

CHF is a pathological condition in which cardiac output, in the presence of moderate venous blood flow, is insufficient to sustain tissues' metabolic needs due to cardiac constriction

and/or diastolic dysfunction. This state clinically manifests as insufficient cardiac output, reduced blood supply in tissues, and stagnation in the body's pulmonary or circulatory venous systems. In terms of hemodynamics, heart failure is a higher-than-normal heart pressure due to myocardial diastolic dysfunction, also known as cardiac insufficiency.

The goal in treating heart failure is not only to improve symptoms and quality of life but also to address the mechanisms of myocardial remodeling, slowing and preventing its development and reducing hospitalizations and decreasing mortality rates for heart failure.[4]

## Treatments

At present, Western medicine is relatively mature in its treatment of CHF, but the patient's experience is poor,[5] the treatment effect isn't obvious, and different degrees of adverse reactions can occur. Adverse effects to Western drugs commonly include impairments in liver and kidney function, gastrointestinal reactions, and neurological discomfort.[6]

The development of the methods of traditional Chinese medicine (TCM) in treatment of disease has occurred gradually over centuries. Compared with Western medicine, TCM generally has fewer side effects and a lower cost; it's highly effective; and patients and their families accept its use. Hu et al found that adverse reactions from TCM, compared with Western medicine, occur less frequently and patients' comfort is higher, thus improving compliance.[7]

## Tonic Heart Qi Soup

Tonic heart qi soup is a TCM that contains a variety of herbs. Its active ingredients are mainly ginseng, astragalus, red licorice, Angelica, atractylodes, and poria. It can improve immunity, having anti-inflammatory and antioxidant effects. Ren's study found that the active ingredients of the tonic heart qi soup can effectively relieve the symptoms of heart failure.[8]

**Ginseng.** Ginseng contains a variety of ginsenosides and polysaccharides and other active ingredients that can stimulate the central nervous system, improving cognitive function and enhancing immunity, and can help alleviate depressive symptoms.[9]

Su et al found that ginsenoside and ginseng polysaccharides can achieve a modulating effect on calcium-ion regulation in cardiac muscle cells through several pathways, such as inhibition of cholinesterase activity,[10] activation of calcium ATPase, regulation of calcium ion channels, and inhibition of peroxidase activity, thus having the effect of improving cardiac function.

Yang et al found that ginsenoside and ginseng polysaccharides can inhibit the activity of cholinesterase and peroxidase and reduce the interference of oxidative stress on the regulation of calcium ions in cardiomyocytes, thus increasing the effects of acetylcholine and maintaining the stability of calcium-ion concentrations in cardiomyocytes.[11] Those researchers also found that it can activate: (1) the calcium ion ATPase in cardiomyocytes at the same time, and promote the outflow of calcium ions, thus regulating the concentration of calcium ions in cardiomyocytes and (2) the calcium ATPase in cardiac myocytes and promote calcium ions excretion, which regulates the intracellular calcium-ion concentration.

Therefore, ginseng saponins and ginsenoside polysaccharide can regulate the balance of calcium ions in cardiac myocytes in a variety of ways, thus improving cardiac function.

**Astragalus and Astragalus astragalus.** TCM commonly uses these herbs. Astragalus contains a variety of active ingredients, such as astragaloside, that can regulate immunity, fight fatigue, enhance physical strength, and help to improve depressive symptoms.[12]

Yang et al found that calcium ions in cardiomyocytes enter cells in two main channels, the L-type calcium channel and the T-type calcium channel.[13] The L-type calcium channel is mainly located on the T-tubular membrane of cardiomyocytes, which is the main channel for calcium ions to enter the cardiomyocytes[14]; the T-type calcium channel is mainly located on the cell body, which plays an important role in the process of cell excitation.

Astragalus promotes the opening of L-type calcium channels,[15] which increases the inward flow of calcium ions, which in turn increases the contractility of heart-muscle cells. Astragalus also inhibits the opening of T-type calcium channels, which reduces the inward flow of calcium ions and reduces the excitability of heart-muscle cells.[16]

Demkes et al found that Astragalus protects heart-muscle cells from oxidative stress and inflammatory damage, which can reduce myocardial cell injury. Demkes et al also found that astragalus can protect heart muscle cells and increase myocardial contractility, and thus, promote the improvement and recovery of heart function.[17]

**Angelica.** Angelica contains aromatic ketones and Chuan dongxin, which can promote hematopoietic function and blood circulation and reduce the occurrence and response of inflammation, thus, protecting cardiomyocytes.

**Atractylodes.** Atractylodes macrocephala contains a variety of volatile oils, mucilage, starch, proteins, and other components, with the role of strengthening the spleen and stomach, stopping diarrhea, and relieving dampness, which can help regulate body functions and relieve depression caused by physical discomfort.

**Poria.** Poria contain a variety of active ingredients, such as poria acid[18] and poria saponin, with diuretic, sedative, and antioxidant effects, and can help relieve depression from factors such as tension and anxiety. Li et al found that it can act on the body to regulate bodily functions and relieve depressive symptoms caused by a variety of factors, including physical and psychological ones.[19]

## Current Study

However, no researchers have studied the effects of tonic heart qi soup for patients with CHF and depression. The current study intended to evaluate the clinical efficacy of tonic heart qi soup in the treatment of CHF for patients with comorbid depression.

## METHODS

### Participants

The research team performed a prospective randomized controlled trial, which took place in the Department of Chinese Medicine at Cangzhou Central Hospital in Cangzhou, Hebei Province, China. Potential participants were CHF patients at the hospital as inpatients or outpatients between January 2016 and January 2019.

The study included potential participants if they: (1) met the diagnostic criteria for CHF[2]; (2) suffered from depression, as judged by psychiatry; (3) had a CHF duration of >1 year; (4) had received a cardiac-function grade upon diagnosis; and (5) were cognitively clear and cooperative.

The study excluded potential participants if they had: (1) other diseases related to myocardial function, (2) hepatic or renal insufficiency, (3) tumors, (4) coagulation dysfunction, (5) a serious mental illness, or (6) recently received the studied TCM medication.

All participants provided written informed consent prior to enrollment (or for the publication). The hospital's ethics committee reviewed and approved the study's protocols.

### Procedures

**Data collection.** For each participant, the research team collected a detailed medical history, performed a physical examination, and completed laboratory investigations.

**Cardiac-function grade.** Grading cardiac function is a clinical method to evaluate the degree of impairment of a patient's cardiac function.[20] Patients heart function generally reflects their conditions' severity and is a good aid in determining whether the heart failure is improving. The most commonly used method of evaluation is the New York Heart Association's ( NYHA) Cardiac Classification.[21]

**Intervention.** The research team divided participants into two groups by lot: (1) an intervention group, which received conventional Western medical treatment combined with treatment with a tonic heart qi soup and (2) a control group, which received conventional Western medical treatment only. Participants in both groups received treatments for about 63 days.

**Tonic heart qi soup.** The research team used a commercial product, Tonic Heart Qi Tang, which contains ginseng, Citrus aurantium, Dragon's tooth, angelica, angelica Radix et Rhizoma oryza, Glycyrrhiza labra, Rhizoma farris, Poria cocos, acanthopanax, astragalus, sempervirens, and Gui Xin.

**B-type natriuretic peptide (BNP) and Ghrelin.** BNP is an important indicator allowing an early diagnosis of and providing a better prognosis in heart failure. Ghrelin protects heart-muscle cells, and Yang et al found that it can improve myocardial, ischemia-induced heart failure and ventricular remodeling by reducing end-diastolic volume (EDV) and increasing left ventricular ejection fraction (LVEF).[22] Ghrelin inhibits apoptosis that late glycosylation end-products mediated

**Outcome measures.** The research team measured: (1) treatment efficacy, (2) cardiac function, (3) adverse reactions,[23] (4) BNP and Ghrelin, and (5) depression.

### Intervention

**Control group.** The control group received heart drugs, diuretics, and vasodilators. The research team instructed the participants to strictly follow the doctors' prescriptions and not to choose the medication themselves, so as to avoid adverse consequences due to improper use of the medication.

The control group received the following drugs: (1) digoxin tablets (Shanghai Pharmaceutical Group, Xinyi Pharmaceutical General Factory H31020678, city, state, China); (2) furosemide tablets (Shanghai Zhaohui Pharmaceutical, H31021074, China); (3) nitroglycerin tablets (Inner Mongolia Lantai Pharmaceutical, H15020179, China); (4) nifedipine sustained-release tablets (Zhejiang Telison Pharmaceutical, H19991088, China); and (5) amitriptyline hydrochloride tablets (Hunan Dongting Pharmaceutical, H43020561, China).

Participants received all of the above drugs once daily. Except for nitroglycerin, which participants took using a sublingual application, they took the drugs orally.

**Intervention group**. The intervention group received the same Western medical treatments as the control group did. In addition, they received an herbal treatment that included the following ingredients: (1) ginseng, with the reed removed; (2) heliotrope, with the flesh removed and the bran fried; (3) dragon's tooth; (4) angelica, with the reed removed and soaked in wine; (5) orris, with the reed removed and fried; (6) licorice, roasted; (7) farmer's root, soaked in soup and with the heart removed; (8) white pori, with the skin removed, one tael each; (9) Fu Shen, with the wood removed, seven taels; (10) Huang Qi, honey coated and roasted, one tael, three taels; (11) half asia qu, roasted; and (12) Gui Xin, with the coarse skin removed and dried, each one tael six money three minutes. The practitioner should: (1) take four pennies each; (2) add three slices of ginger and two jujubes, a gummy type of candy, to one and a half colanders of water; (3) decoct the solution for eight minutes; and (4) remove the dregs. Participants took the solution twice a day before eating.

### Outcome Measures

**Treatment Efficacy.** The research team measured treatment efficacy according to the diagnostic criteria related to CHF in the *Guidelines for the Treatment of Common Diseases in Chinese Medicine (Western Medicine)*. The possible results were: (1) apparently effective = a reduction in the heart failure score of >75%; (2) effective = a reduction in the heart failure score of 50%-75%; and (3) ineffective = a reduction in the heart failure score of <50%. The greater the value, the more severe the heart failure symptoms. Total efficacy = apparently effective + effective.[24]

**Cardiac function.** The research team measured cardiac function according to the NYHA cardiac function[21]: (1) an improvement in the NYHA class to ≥ one class or the normal standard, with no symptoms such as fatigue and angina pectoris = apparently effective; (2) an improvement in the NYHA class of < one class, with no symptoms at rest but with fatigue and angina pectoris appearing after exercise = effective;

and no improvement in the NYHA class = ineffective. The total effective rate = apparently effective rate + effective rate.[25]

**Adverse reactions.** The research team measured the incidence of adverse reactions and compared the occurrence of adverse reactions between the groups.

**Depression.** The research team measured depression using the Symptom Checklist 90-R (SCL-90-R) and the Zung Self-Rating Depression Scale (SDS) to determine whether the patient's depression level had decreased between baseline and postintervention.[26]

### Statistical Analysis

The research team analyzed the data using the SPSS 17.0 statistical software. The team: (1) expressed qualitative data as numbers (N) and percentages (%) and compared the groups using the Chi-square ($\chi^2$) test and (2) expressed quantitative data as means and standard deviations (SDs) and compared the groups using the *t* test. $P < .05$ indicated a statistically significant difference.

## RESULTS

### Participants

The research team included and analyzed the data of 120 participants, 60 in the intervention group and 60 in the control group (Table 1).

**Table 1.** Participants' Demographic and Clinical Characteristics at Baseline

| Characteristic | Intervention Group n = 60 Mean ± SD n (%) | Control Group n = 60 Mean ± SD n (%) |
|---|---|---|
| Age, y | 64.23 ± 10.45 | 65.46 ± 9.12 |
| Gender | | |
| Males | 33 (55.00) | 37 (61.67) |
| Females | 27 (45.00) | 23 (38.33) |
| Disease | | |
| Coronary heart disease | 24 (40.00) | 18 (30.00) |
| Hypertensive heart disease | 16 (26.67) | 12 (20.00) |
| NYHA Grade | | |
| Grade II | 16 (26.67) | 18 (30.00) |
| Grade III | 24 (40.00) | 22 (36.67) |
| Grade IV | 20 (33.33) | 20 (33.33) |
| Duration of Heart Failure, y | | |
| Range | 1-20 | 1-20 |
| Mean | 12.2 ± 4.3 | 13.52 ± 3.3 |
| Duration of Depression | | |
| Range | 3-5 | 3-5 |
| Mean | 3.46 ± 1.62 | 3.16 ± 2.22 |
| Depression Severity | | |
| Mild | 28 (46.67) | 38 (63.33) |
| Moderate | 22 (36.67) | 16 (26.67) |
| Severe | 10 (16.66) | 6 (10.00) |

**Table 2.** Comparison of Effective Rate Between the Intervention and Control Groups (N=120)

| Group | Participants n (%) | Apparently Effective n (%) | Effective n (%) | Ineffective n (%) | Total Effective Rate n (%) |
|---|---|---|---|---|---|
| Control Group | 60 (50.00) | 12 (20.00) | 13 (21.67) | 35 (21.67) | 25 (41.67) |
| Intervention Group | 60 (50.00) | 33 (55.00) | 22 (36.67) | 5 (8.33) | 55 (91.67) |
| $\chi^2$ | - | 26.133 | 5.445 | 56.253 | 56.253 |
| *P* value | - | .000[a] | 0.020[b] | .000[a] | .000[a] |

[a]$P < .001$, indicating that the intervention group's apparently effective and total effective rates were significantly higher than those of the control group and that its ineffective rate was significantly lower than that of the control group
[b]$P < .05$, indicating that the intervention group's effective rate was significantly higher than that of the control group

The intervention group included 33 men (55.00%) and 27 women (45.00%), aged 64.23 ± 10.45 years. At baseline, of the 60 participants in that group: (1) 24 had coronary heart disease (40.00%), and 16 had hypertensive heart disease (26.67%); (2) according to the NYHA grading scale, 16 had grade II heart function (26.67%), 24 had grade III heart function (40.00%), and 20 had grade IV heart function (33.33%); (3) the range of the duration of heart failure was 1-20 years, with a mean time of 12.2 ± 4.3 years; and (4) the range of the duration of depression was 3-5 years, with a mean time of 3.46 ± 1.62 years. For depression in the intervention group, 28 participants had mild depression (46.67%), 22 had moderate depression (36.67%), and 10 (16.66%) had severe depression.

The control group at baseline included 37 men (61.67%) and 23 women (38.33%), aged 65.46 ± 9.12 years. Of the 60 participants in that group: (1) 18 had coronary heart disease (30.00%), and 12 had hypertensive heart disease (20.00%); (2) 18 had grade II heart function (30.00%), 22 had grade III heart function (36.67%), and 20 had grade IV heart function (33.33%); (3) the range of the duration of heart failure was 1-20 years, with a mean time of 13.52 ± 3.3 years; (4) the range of the duration of depression was 3-5 years, with a mean duration of 3.16 ± 2.22 years. For depression in the control group, 38 participants had mild depression (63.33%), 16 had moderate depression (26.67%), and 6 had severe depression (10.00%).

No significant differences existed between the groups at baseline.

### Effective Rate

For the intervention group, Table 2 shows that the rate for 33 participants met the criteria for apparently effective (55.00%), 22 met the criteria for effective (36.67%), and 5 met the criteria for ineffective (8.33%), with the total effective rate being 91.67% for 55 participants.

For the control group, 12 participants met the criteria for apparently effective (20.00%), 13 met the criteria for effective (21.67%), and 35 met the criteria for ineffective (21.67%), with the total effective rate being 41.67% for 25 participants.

The intervention group's apparently effective rate ($P = .000$), effective rate ($P = .020$), and total effective rate ($P = .000$) were significantly higher than those of the control group, and the group's ineffective rate ($P = .000$) was significantly lower than that of the control group

### Cardiac Function

Table 3 shows that the cardiac-function scores postintervention were significantly better than those at baseline for both groups ($P < .05$). In the intervention group postintervention, 10 participants met the criteria for grade II heart function (16.67%), 18 for grade III heart function (30.00%), and 22 for grade IV heart function (36.67%), with 28 participants having improved their grades (46.67%).

In the control group postintervention, 16 participants met the criteria for grade II heart function (26.67%), 21 for

grade III heart function (35.00%), and 23 for grade IV heart function (38.33%), with 7 participants having improved their grades (11.67%).

The intervention group's cardiac function was significantly better than that of the control group postintervention ($P$ = .000).

### Adverse Reactions

Table 4 shows that no participants in the intervention group experienced liver function impairment, renal function impairment, insomnia, or nausea, but one participant experienced dizziness and fatigue, with the total incidence rate being 1.67%.

In the control group, no participants experienced liver function impairment or renal function impairment, but two participants experienced insomnia (3.33%), three experienced dizziness and fatigue (5.00%), and two participants experienced nausea (3.33%) with the total incidence rate being 11.67% for seven participants.

The intervention group had significantly lower incidence rates of insomnia ($P$ = .000), dizziness and fatigue ($P$ = .000), and nausea ($P$ = .000) than the control group did and the group's total incidence was also significantly lower than that of the control group.

### BNP and Ghrelin

Figure 1 shows that a significant decrease in BNP and Ghrelin occurred between baseline and postintervention for both groups. Table 5 shows that the intervention group's BNP, at 1031.58 ± 118.83 pg/ml ($P$ < .001), and Ghrelin, at 481.46 ± 57.53% ($P$ < .001), postintervention, were significantly lower than those of the control group.

### Depression

Table 6 shows that the treatments for the intervention group were apparently effective for 32 participants (53.34%), effective for 20 participants (33.33%), and ineffective for eight participants (13.33%), and the total effective rate was 86.67%, for 52 participants. For the control group, the treatments were apparently effective for 22 participants (36.67%), effective for 12 participants (20.00%), and ineffective for 26 participants (43.33%), and the total effective rate was 56.67%, for 34 participants. The intervention group's apparently effective ($P$ = .039), effective ($P$ = .038), and total effective ($P$ = .029) rates were significantly higher than those of the control group, and its ineffective rate was significantly lower than that of the control group.

**Table 3.** Comparison of Changes Between Baseline and Postintervention in Cardiac Function for the Intervention and Control Groups (N=120)

| Group | Time | Cardiac Function Grade II N (%) | Cardiac Function Grade III n (%) | Cardiac Function Grade IV n (%) | $\chi^2$ | *P* value |
|---|---|---|---|---|---|---|
| Intervention Group, n = 60 | Baseline | 16 (26.67) | 24 (40.00) | 20 (33.33) | 14.769 | .000[a] |
| | Postintervention | 10 (16.67) | 18 (30.00) | 22 (36.67) | | |
| Control Group, n = 60 | Baseline | 18 (30.00) | 22 (36.67) | 20 (33.33) | | |
| | Postintervention | 16 (26.67) | 21 (35.00) | 23 (38.33) | | |

[a]$P$ < .001, indicating that the intervention group's

**Table 4.** Incidence of Adverse Reactions in the Intervention and Control Groups (N=120)

| Group | Participants n (%) | Liver Function Impairment n (%) | Renal Function Impairment n (%) | Insomnia n (%) | Dizziness and Fatigue n (%) | Nausea n (%) | Total Incidence n (%) |
|---|---|---|---|---|---|---|---|
| Control Group | 60 (50.00) | 0 (0.00) | 0 (0.00) | 2 (3.33) | 3 (5.00) | 2 (3.33) | 7 (11.67) |
| Intervention Group | 60 (50.00) | 0 (0.00) | 0 (0.00) | 0 (0.00) | 1 (1.67) | 0 (0.00) | 1 (1.67) |
| $\chi^2$ | - | - | - | 58.000 | 54.069 | 58.000 | - |
| *P* value | - | - | - | .000[a] | .000[a] | .000[a] | - |

[a]$P$ < .001, indicating that the intervention group's incidence of insomnia, dizziness and fatigue, and nausea and its total incidence of adverse effects were significantly lower than those of the control group

**Table 5.** Comparison of the BNP and Ghrelin Outcome Measures Postintervention Between the Intervention and Control Groups

| Outcome Measure | Intervention Group n = 60 Mean ± SD | Control Group n = 60 Mean ± SD | *t* | *P* value |
|---|---|---|---|---|
| BNP, pg/ml | 1031.58 ± 118.83 | 1512.41 ± 143.76 | 19.96 | 0.000 |
| Ghrelin, % | 481.46 ± 57.53 | 558.54 ±76.81 | 5.497 | 0.000 |

**Abbreviation:** BNP, B-type natriuretic peptide

**Table 6.** Comparison of Depression Between the Intervention and Control Groups (N=120)

| Group | Participants n (%) | Basic Cure n (%) | Apparently Effective n (%) | Effective n (%) | Ineffective n (%) | Total Effective Rate n (%) |
|---|---|---|---|---|---|---|
| Intervention Group | 60 (50.00) | 0 (0.00) | 32 (53.34) | 20 (33.33) | 8 (13.33) | 52 (86.67) |
| Control Group | 60 (50.00) | 0 (0.00) | 22 (36.67) | 12 (20.00) | 26 (43.33) | 34 (56.67) |
| $\chi^2$ | - | - | 4.252 | 4.318 | 4.762 | - |
| *P* value | - | - | .039[a] | .038[a] | .029[a] | - |

[a]$P$ < .001, indicating that the control group's apparent effect, effective, and total effective rates were significantly higher than those of the intervention group and that its ineffective rate was significantly lower than that of the intervention group

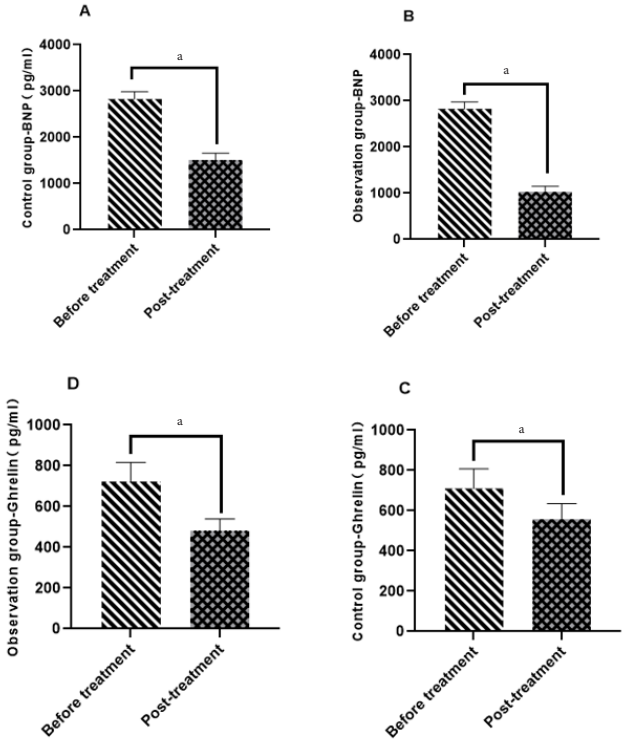
## DISCUSSION

The current study found that the intervention group's cardiac function improved significantly compared with that of the control group, and the patients could show the reduction of chest tightness and shortness of breath and the increase of activity ability.

The current study found that a significant decrease occurred in the BNP and Ghrelin indexes for both groups. Also, the study found that the intervention group's myocardial contractility increased, with cardiac function being effectively restored compared to the control group.

The current study found that the control group's overall efficacy in decreasing depression was only 56.67%, and 26 patients didn't think Western medicine could improve their depression.In contrast, the intervention group's overall efficacy was 86.67%, significantly higher than that of the control group. Thus, TCM can not only relieve the occurrence

**Figure 1.** Comparison of the Changes Between Baseline and Postintervention in BNP and Ghrelin Between the Intervention and Control Groups. Figures 1A and 1B show the changes in BNP and Figures 1C and 1D show the changes in Ghrelin.




[a]$P < .001$, indicating that a significant decrease in BNP and Ghrelin occurred between baseline and postintervention for both groups

**Abbreviation:** BNP, B-type natriuretic peptide.

and development of heart failure and improve myocardial function but also can improve patients' depression and contribute to recovery in chronic heart failure.

The study had some limitations. Dur to the small number of participants in the current study, the experimental data aren't generally representative, so it's advisable to expand the sample size for an in-depth study.

## CONCLUSIONS

Heart Qi Tonic Tang, as an adjunctive therapy, significantly improved outcomes for CHF patients with depression. It effectively reduced heart failure symptoms, with minimal adverse reactions and increased patient comfort and compliance.

### AUTHORS' DISCLOSURE STATEMENT

The authors declare that they have no conflicts of interest related to the study.

### AVAILABILITY OF DATA AND MATERIALS

The experimental data used to support the findings of this study are available from the corresponding author upon request.

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