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A retrospective study of traditional Chinese medicine as an adjunctive therapy for patients with chronic heart failure

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Abstract

This study retrospectively evaluated the effectiveness and safety of traditional Chinese medicine Shenqilixin Formula (SQLXF) as an adjunctive intervention for treating patients with chronic heart failure (CHF).

This retrospective study included 135 patients with CHF. They were allocated to a treatment group or a control group according to the different treatments they received. Seventy five patients in the treatment group underwent SQLXF plus routine treatment, while 60 subjects in the control group received routine treatment only. The primary outcome was cardiac function. It was measured by the left ventricular end diastolic diameter (LVDD), left ventricular ejection fraction (LVEF), cardiac output (CO), every cardiac output (ECO), and cardiac index (CI). The secondary outcome included motor function. It was measured by the standard 6-MinuteWalk Test (6MWT). In addition, adverse events (AEs) were also recorded.

Compared to subjects in the control group, patients in the treatment group revealed greater effectiveness in cardiac function, measured by LVEF ($P < .05$), CO ($P < .05$), and ECO ($P < .05$), and motor function, measured by the 6MWT scale ($P < .05$). Moreover, no significant differences of AEs were found between the 2 groups.

SQLXF as an adjunctive therapy to routine treatment may help to improve both cardiac and motor function in patients with CHF.

Abbreviations: 6MWT = 6-MinuteWalk Test, AEs = adverse events, CHF = chronic heart failure, CI = cardiac, CO = cardiac output, ECO = every cardiac output, LVDD = left ventricular end diastolic diameter, LVEF = left ventricular ejection fraction, NYHA = New York Heart Association, SQLXF = Shenqilixin Formula.

Keywords: chronic heart failure, effectiveness, Shen Qi Li Xin formula

1. Introduction

Chronic heart failure (CHF) is a very common condition among the cardiology diseases.[1–3] It is often associated with high mortality rates, frequent hospitalizations, and also the poor quality of life in patients with CHF.[4,5] Its prevalence rate is reportedly 26 million worldwide,[5] and more frequent with increasing age, with 10% among patients more than 70 years.[5–7] It affects nearly 4.2 million people from China with 1.3% prevalence rates.[8,9] The incidence of CHF has been reported as 0.7 to 0.9 per 1000 in the Chinese population.[10,11] Additionally, its incidence continues increasing in China because of the rapidly aging population.[8]

Its treatment focuses on managing symptoms improvement with lifestyle changing, taking medications and surgery. However, in many patients, CHF cannot be controlled with a single type of intervention, and most patients still suffer from poorly controlled CHF symptoms and poor quality of life.[12,13] It has been reported that regular treatment can effectively control CHF. However, it still has limited effectiveness.[14]

Complementary medicine, especially traditional Chinese medicine is an effective alternative treatment for patients with CHF.[15–24] Of those, Shenqilixin Formula (SQLXF) has been used to treat patients with CHF in China with few adverse events (AEs).[19–24] However, there is still limit data of SQLXF for treating CHF. More clinical evidence is still needed to support its effectiveness and safety. Therefore, in this retrospective study, we evaluated the effectiveness and safety of SQLXF for treating Chinese patients with CHF.

2. Methods and materials

2.1. Ethic approval

This retrospective study was approved by the ethics committee of The First Affiliated Hospital of Heilongjiang University of Chinese Medicine. All patients provided written informed consent.

2.2. Study design

It was operated between January 2015 and November 2017 at The First Affiliated Hospital of Heilongjiang University of

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The authors have no conflicts of interest to disclose.

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Chinese Medicine. Around 135 eligible patients with CHF were assigned to a treatment group (75 patients) or a control group (60 patients) according the different treatments they received. Patients in the treatment group received SQLXF as an adjunctive therapy to routine treatment, while subjects in the control group received routine treatment only.

2.3. Patients

All eligible patients with CHF and the symptoms of New York Heart Association (NYHA) functional class (II–IV) were included in this retrospective study.[25] All patients aged between 51 and 83 years. Patients were excluded if they had severe valve stenosis; cardiomyopathy (hypertrophy or restriction); pericarditis (constriction), myocarditis; acute myocardial infarction; cardiogenic shock; various malignancies, trauma, connective tissue disease, pregnancy and breastfeeding; severe liver, renal insufficiency. All outcomes were measured before and after 6 months treatment.

2.4. Intervention

All patients in both groups were administrated routine treatment according to clinical standard treatment of CHF, such as eating less salt, limiting fluid intake, and taking prescription medications. The prescription medications included trimetazidine hydrochloride for the improvement of myocardial energy metabolism; and aspirin and atorvastatin for the secondary prevention of coronary heart disease. Patients received these interventions based on the actual situation of patients with cardiac, diuretic and nitroprusside in order to improve heart failure. In addition, patients in the treatment group also received SQLXF (Ginseng 20 g, Astragalus 20 g, Cassia twig 10 g, Epimedium 15 g, Semen lepidii 20 g, Atractylodes 15 g, Motherwort 15 g, Poria 20 g, Atractylodes 15 g, Motherwort 15 g, Salvia 15 g, Agrimony 30 g, licorice 10 g),[19] once daily at every morning and evening time before meals, for a total of 6 months treatment.

SQLXF was provided by the Department of Medication Preparation of The First Affiliated Hospital of Heilongjiang University of Chinese Medicine with the Decoctable Packaging Machine (Donghua Decoction Machine: YF12/3+1, Beijing, China).[26] The prescribed herbal medication of SQLXF was put into the decoction machine. After decocting, each prescription was automatically divided into 2 bags, each bag 150 mL for one day consumption.

2.5. Outcome measurements

The primary outcome was cardiac function, measured by the left ventricular end diastolic diameter (LVDD),[27] left ventricular ejection fraction (LVEF),[28] cardiac output (CO),[29] every cardiac output (ECO),[30] and cardiac index (CI)[31] through the color Doppler echocardiography. The secondary outcomes included motor function, measured by the standard 6-Minute-Walk Test (6MWT),[32] and AEs related to the treatment of SQLXF. All the outcomes were measured before and after 6-month treatment.

2.6. Statistical analysis

Statistical Package for the Social Sciences (SPSS) software (version.17.0) was used to analyze all the characteristic values, and outcome data. The *t*-test or Mann–Whitney rank sum test was utilized to analyze continuous data; and Chi-square test test was used to analyze the categorical data. $P < .05$ was recommended as statistically significant.

3. Results

Around 135 patients were initially included in this retrospective study (Table 1). No significant differences of all characteristics were found before the treatment 2 groups (Table 1).

All outcome evaluations are shown in Table 2. When compared to the patients in the control group, patients in the treatment group showed better effect in LVEF, CO, ECO, and 6MWT distance, respectively ($P < .05$), although the negative results of LVDD ($P = 0.23$) and CI ($P = 0.31$) were detected.

All AEs recorded in both groups are listed in Table 3. No significant differences in all AEs were found between the 2 groups. The most frequent AEs were dyspepsia, bloating, and abdominal discomfort. No death related to the treatment occurred.

4. Discussion

Many factors can result in CHF, such as coronary heart disease, myocardial ischemia, myocardial infarction, cardiomyopathy, cardiac overload, and so on.[1,4,5] Initially, they may cause myocardial injury, then lead to ventricular filling and (or)

Table 1

Characteristics of all eligible included patients.

Values	Treatment group (n = 75)	Control group (n = 60)	*P* value
Mean age, years	56.4 (9.7)	58.1 (10.2)	.33
Gender			
Male	42 (56.0)	35 (58.3)	.79
Female	33 (44.0)	25 (41.7)	.79
BMI, kg/m^2	28.5 (4.1)	28.8 (3.9)	.79
Resting systolic BP, mm Hg	109.8 (10.7)	110.6 (11.2)	.67
Resting HR, beats/min	71.0 (5.5)	70.8 (6.0)	.84
NYHA functional class			
II	40 (53.3)	33 (55.0)	.85
II	23 (30.7)	22 (36.7)	.46
IV	12 (16.0)	8 (13.3)	.67
LVDD, mm	62.2 (11.4)	61.9 (11.7)	.88
LVEF, %	24.8 (4.2)	24.5 (4.1)	.68
CO, L/min	6.1 (0.3)	6.0 (0.4)	.11
ECO, mL	65.5 (13.8)	65.7 (14.0)	.93
CI, L/(min m^2)	2.5 (0.4)	2.6 (0.4)	.15
6MWT distance, m	369.6 (60.4)	378.2 (57.5)	.41
Comorbidities			
Diatetes	26 (34.7)	21 (35.0)	.97
Hypertension	43 (57.3)	36 (60.0)	.75
Stroke	18 (24.0)	13 (21.7)	.75
Family history of CHF	10 (13.3)	9 (15.0)	.78
Smoking	36 (48.0)	31 (51.6)	.67
Alcohol	27 (36.0)	20 (33.3)	.75
Concomitant medications			
ACEIs/ARBs	69 (92.0)	56 (93.3)	.77
Diuretics	64 (85.3)	51 (85.0)	.96
Digoxin	57 (76.0)	49 (81.7)	.43
Anti-thrombotic agents	63 (84.0)	52 (86.7)	.67

Data are present as mean ± standard deviation or number (%); 6MWT = standard 6-MinuteWalk Test, ACEI = angiotensin-converting enzyme inhibitor, ARB = angiotensin receptor blocker, BMI = body mass index, CI = cardiac index, CO = cardiac output, ECO = every cardiac output, HR = heart rate, LVDD = left ventricular end diastolic diameter, LVEF = left ventricular ejection fraction, NYHA = New York Heart Association.

Table 2

Primary and secondary outcomes after 6 months treatment.

Outcomes	Treatment group (n = 75)	Control group (n = 60)	Difference	*P* value
LVDD, mm	−1.2 (−1.9, −0.4)	−0.3 (−0.7, 0.2)	−0.8 (−1.4, −0.3)	.23
LVEF, %	6.7 (4.1, 9.3)	2.5 (1.1, 3.8)	4.2 (3.0, 5.4)	<.05
CO, L/min	0.9 (0.4, 1.3)	0.3 (0.1, 0.5)	0.7 (0.4, 1.1)	<.05
ECO, mL	7.4 (4.9, 9.0)	2.3 (1.4, 5.7)	5.1 (3.3, 7.5)	<.05
CI, L/min m^2	0.3 (0.1, 0.6)	0.2 (0.1, 0.4)	0.1 (0.2, 0.3)	.31
6MWT distance, m	172.6 (133.8, 216.9)	87.9 (51.4, 118.7)	94.8 (66.5, 124.0)	<.05

Data are present as mean ± standard deviation or number (%); 6MWT = standard 6-MinuteWalk Test, CI = cardiac index, CO = cardiac output, ECO = every cardiac output, LVDD = left ventricular end diastolic diameter, LVEF = left ventricular ejection fraction.

ejection, and eventually develop to the CHF. Patients with such condition often involve in poor heart and motor function, and even the poor quality of life.[10]

SQLXF has been reported to treat CHF by several previous animal experimental and clinical studies.[19–24,33–38] Animal experimental studies found that SQLXF can effectively enhance cardiac function in CHF rats by regulating the energy metabolism of impaired cardiomyocytes, and the expression of mitochondrial uncoupling protein 2; improving myocardial tissue morphology, inhibiting ventricular remodeling, adenosine triphosphate, creatine phosphate and insulin resistance; reducing death rates of CHF rats, decreasing the expression of Caspase-3 and Caspase-9 in myocardium, the content of free fatty acids, and fasting blood glucose.[33–38] The results of clinical studies showed that SQLXF can improve the serum levels of Galectin-3, B-Brain natriuretic peptide, soluble intercellular adhesionmolecule-1 in patients with CHF. Moreover, it can also improve clinical symptoms, cardiac and motor function, as well as the quality of life in patients with such condition.[19–24]

The results of this study found that SQLXF with routine treatment was superior to routine treatment alone for treating CHF at the end of 6-month treatment. Our results are partly consistent with the previous studies,[19,20] which indicate that SQLXF may help to improve either the cardiac function, or the motor function in patients with CHF.

Our study also has 3 limitations. First, the achieved effectiveness was the results of the synergistic effectiveness of SQLXF with routine treatment, and not of SQLXF alone, although the baseline medications were similar between both groups. Second, it was difficult to discern whether the AEs were caused by SQLXF or routine treatment, because all patients in the treatment group underwent both medications. Third, the present study did not include the evaluation of the quality of life in patients with CHF. Further studies should avoid these limitations.

Table 3

Adverse events.

Adverse events	Treatment group (n = 75)	Control group (n = 60)	*P* value
Dyspepsia	5 (6.7)	4 (6.7)	1.00
Bloating	4 (5.3)	2 (3.3)	.58
Abdominal discomfort	4 (5.3)	3 (6.7)	.93
Abdominal pain	2 (2.7)	2 (5.0)	.82
Diarrhea	1 (1.3)	0 (0)	.59

Data are present as number (%).

5. Conclusion

The results of the present study demonstrate that SQLXF as an adjunctive therapy to routine treatment may help to enhance both cardiac function and motor function in patients with CHF.

Author contributions

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