

Original Article

Effect of continuous traditional Chinese medicine nursing on patients with coronary heart disease

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Received April 18, 2021; Accepted May 31, 2021; Epub August 15, 2021; Published August 30, 2021

Abstract: Objective: To investigate the effect of continuous traditional Chinese medicine (TCM) nursing combined with atorvastatin tablets on psychological status, quality of life, and sleep quality of patients with coronary heart disease (CHD). Methods: One hundred CHD patients admitted in Jinan City People's Hospital from January 2018 to January 2019 were divided into an experimental group and a control group according to the order of admission, with 50 patients in each group. The experimental group was treated with continuous TCM nursing with atorvastatin tablets, while the control group took atorvastatin tablets alone. The therapeutic effect, psychological status, levels of inflammatory factors, quality of life, sleep quality, cardiac function index, physical signs, treatment compliance and nursing satisfaction were compared. Results: After the intervention, the two groups witnessed notably decreased levels of high-sensitivity C-reactive protein (hs-CRP), serum tumor necrosis factor- α (TNF- α), interleukin-6 (IL-6), and matrix metalloproteinase-9 (MMP-9) compared with those before treatment, with lower levels observed in the experimental group. The psychological status, quality of life, sleep quality, cardiac function indexes, physical signs, and treatment compliance of the experimental group were generally better than the control group. The experimental group had better outcome in the therapeutic effect and nursing satisfaction than the control group ($P < 0.05$). Conclusion: Continuous TCM nursing combined with atorvastatin tablets optimizes psychological status, quality of life, and sleep quality of CHD patients, which exhibits therapeutic benefit, and effectively avoids the occurrence of nurse-patient disputes.

Keywords: Continuous TCM nursing, atorvastatin tablets, CHD

Introduction

CHD and hypertension are common cardiovascular diseases in clinics, to which elderly people are most susceptible. CHD is mainly caused by myocardial ischemia and coronary insufficiency [1-3], with a risk factor of abnormal increase in blood lipids. Late discovery and delayed treatment may lead to acute myocardial infarction and even threaten the life of patients [4, 5]. Statins can control the blood lipid, improve the prognosis of patients, and thus reduce the occurrence of related complications. However, in the course of treatment, the deficit of CHD knowledge in elderly patients easily leads to negative psychological reactions such as anxiety and fear, and even coronary spasm, thus impeding the treatment effect [6]. Appropriate nursing intervention for patients

with CHD can substantially avoid the occurrence of such phenomena. Clinically, apart from active drug treatment, effective psychological care is also indispensable to eliminate the negative emotions of patients such as anxiety, fear, and role disorder, so as to further encourage patients to develop good habits and secure a healthy physical condition. Continuous TCM care values the idea of "the unity between man and nature". Nursing is carried out through differentiation of symptoms and the three-type-cause of disease for patients with different conditions. Care can be continued even if the patient is discharged from the hospital. One hundred CHD patients were studied to further study the effect of continuous TCM combined with atorvastatin tablets on the psychological status, quality of life, and sleep quality of patients.

Data and methods

Patient data

One hundred CHD patients admitted to Jinan City People's Hospital from January 2018 to January 2019 were divided into an experimental group and a control group according to the order of admission, with 50 patients in each group. Patients in the control group were aged from 59 to 72 years old, with a mean age of $[(65.67 \pm 1.24)$ years old]. The course of the disease lasted for 6 months to 2 years $[(1.09 \pm 0.31)$ years]. There were 22 female patients, including 13 patients with myocardial infarction, 30 patients with angina pectoris, and 7 patients with silent myocardial ischemia. Patients in the experimental group were aged from 63-77 years old with a mean age of $[(67.31 \pm 1.29)$ years old]. The course of disease ranged from 6 months to 2 years $[(1.06 \pm 0.24)$ years]. There were 24 female patients, 12 patients with myocardial infarction, 29 patients with angina pectoris, and 9 patients with silent myocardial ischemia.

Inclusion criteria: a) All patients were diagnosed with CHD [7] by professional doctors; b) Patients had good communication skills and clear language expression ability; c) Patients and their families signed informed consent after being fully informed of the study.

Exclusion criteria: a) Patients with drug contraindications, respiratory failure, liver and kidney dysfunction, or mental disorders; b) Patients who could not participate in the whole treatment and follow-up visits; c) Patients who had other diseases and with an expected life span of less than one year.

Methods

The control group was given atorvastatin tablets (Pfizer Pharmaceutical Co., Ltd.; Guo Yao Zhun Zi: H 20051408; Specification: 20 mg) and conventional nursing mode. Medication instruction: 10 mg each dose, once every night. The course of treatment lasted 4 weeks. Meanwhile, the patients were given drug guidance, diet guidance, and life coaching.

The experimental group received continuous TCM nursing combined with atorvastatin tablets, and the use of atorvastatin tablets was

same as the control group. In the process of continuous TCM nursing, we first set up a continuous nursing group, and educated patients with knowledge about CHD through daily guidance during the treatment of patients [8-10]. During the treatment, patients with strong liver-fire can play music of quotient mode to stabilize their emotions and blood pressure. Health records for patients were established when the patients were discharged from the hospital, which recorded the medication, basic condition, and behavior habits of patients in detail, and built up a continuous nursing plan for patients [11-13]. The implementation of continuous TCM nursing mainly consists of: ① Emotional inter-restrictive therapy. Under the instruction of the theory of restriction among the five elements and Happiness over Sadness theory, the nurses introduced the purpose and significance of treatment and successful cases to the patients. In addition, entertainment programs were given to distract the patients, to prominently alleviate their negative emotions, and help them receive treatment and nursing more positively. ② Positive mentality cultivation. During the treatment process, nurses provided reading materials such as books and newspapers according to patients' characteristics and interests, to eliminate their worries and ease their minds. ③ Question resolving. The nurses actively communicated with the patients comprehensively explained the knowledge about the disease and answered their questions roundly and earnestly. Personalized intervention for the patients' negative emotions was also carried out to support, comfort, and encourage them to adopt a proper attitude toward the disease. Moreover, enough sleep time should be guaranteed during treatment. Telephone follow-up was conducted once a week to timely understand the patients' condition. A special WeChat group was set up to publicize the knowledge of TCM nursing through the official account. Chrysanthemum, selfheal, silkworm excrement, and other TCM can be used to make pillows and sachets, to achieve auxiliary therapeutic effects [14, 15].

Indicators observed

The treatment effect, psychological status, quality of life, sleep quality, cardiac function index, blood pressure, serum lipid, treatment compliance, and nursing satisfaction were

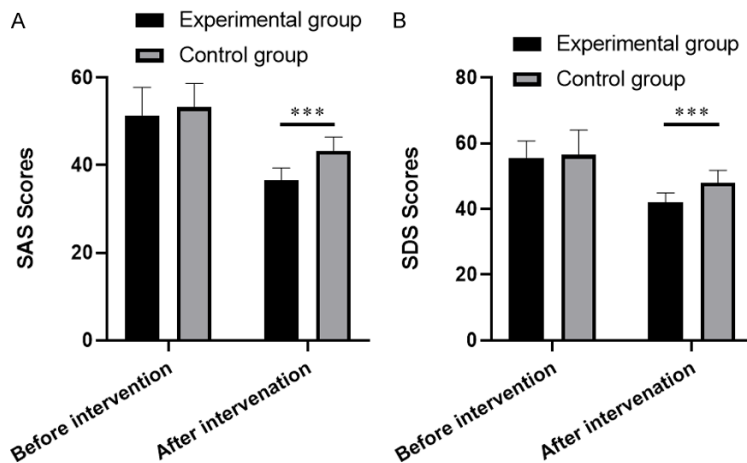


Figure 1. Comparison of SAS scores (A) and SDS scores (B) between two groups of patients. *** indicates $P < 0.001$.

compared. The treatment efficacy is divided into obviously effective, effective, and ineffective. The “obviously effective” indicates that the pain in the precordial region disappears and the chest tightness is relieved, the “effective” indicates that the pain in the precordial region is improved, and the “ineffective” means that the pain in the precordial region and the chest tightness show no obvious change.

The psychological status of patients was evaluated by Self-Rating Anxiety Scale (SAS) and Self-Rating Depression Scale (SDS). The SAS and SDS scores reflect the degree of anxiety and depression of the patients, respectively. There are 20 evaluation items, corresponding to 20 symptoms of anxiety or depression. Each item is scored from 1 to 4 points according to the severity of symptoms. The total scores of the 20 items are rounded and multiplied by 1.25 to obtain a standard score. The higher the standard score of the two scores, the more severe the corresponding anxiety or depression symptoms. The Pittsburgh Sleep Quality Index was used to evaluate the sleep quality of the two groups of patients from the three dimensions of Falling Asleep Time, Sleep Time, and Sleep Quality. The full score is 21 points. The lower the score, the better the quality of sleep. The quality of life was evaluated by the China questionnaire of quality of life in patients with cardiovascular diseases (CQQC) scale, including working conditions, life function, and physical strength. The higher the score, the higher the quality of life. Inflammatory factor detec-

tion: Peripheral venous blood before and after treatment was collected and centrifuged to separate the serum. High-sensitivity C-reactive protein (hs-CRP) was measured by the immunoenhanced turbidimetric method using the NORMAN-4 turbidimetric analyzer from Nanjing Norman Biotechnology Co., Ltd. Tumor necrosis factor- α (TNF- α), interleukin-6 (IL-6), and matrix metalloproteinase-9 (MMP-9) were determined by double-antibody sandwich enzyme-linked immunosorbent assay. The kit was purchased from Shenzhen Jingmei Biotechno-

logy Co., Ltd. Engineering Co., Ltd. The indexes of cardiac function include LVEF, LVEFDD, and 6 min-walking distance were evaluated in clinics and compared at the moment and one month after the intervention.

Statistical analysis

SPSS21.0 software was used for data analysis. All the measured data were analyzed by t-test and presented as (mean \pm standard deviation). All the counted data were tested by χ^2 , which was expressed as (n, %). A p -value < 0.05 was considered significant.

Results

Comparison of SAS scores and SDS scores between the two groups

Before treatment, the two groups did not present great disparity in terms of SAS and SDS scores ($P > 0.05$). However, the scores declined drastically after treatment, with lower scores obtained in the experimental group than the control group ($P < 0.05$). ($P < 0.01$, **Figure 1**).

Comparison of CQQC scores between the two groups

The scores of working condition, life function, and physical strength were (5.52 ± 0.42), (9.23 ± 0.22) and (15.13 ± 3.34) in the experimental group, and (2.78 ± 0.35), (5.62 ± 0.42) and (8.62 ± 2.26) in the control group respectively. Moreover, it can be easily seen that the experi-

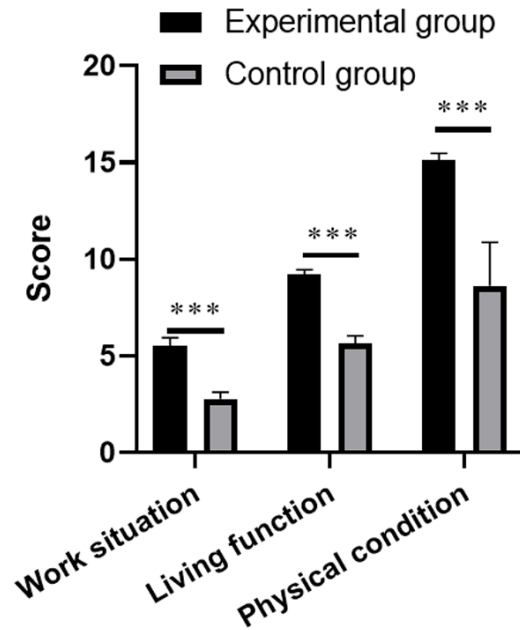


Figure 2. Comparison of CQQC scores between two groups. ***indicates $P < 0.001$.

mental group yielded higher scores than the control group ($P < 0.01$, **Figure 2**).

Comparison of sleep quality scores between the two groups

Results demonstrated a better sleep quality in the experimental group whose scores of Sleep Time and Sleep Quality were (1.36 ± 0.52), (1.41 ± 0.42) and (1.33 ± 0.52), in respect, as compared to the corresponding scores of (1.67 ± 0.55), (1.61 ± 0.51) and (1.56 ± 0.52) in the control group ($P < 0.05$, **Figure 3**).

Comparison of the cardiac function and inflammatory indicators in two groups

Before the intervention, there was no significant difference in the inflammatory indexes between the two groups of patients. After the intervention, lower serum hs-CRP, TNF- α , IL-6, and MMP-9 levels were noted in both groups than before treatment, with lower results in the experimental group than the control group ($P < 0.05$, **Table 1**). At the moment of, and one month after the intervention, the LVEFDD level was lower in the experimental group than the control group, while the experimental group had a better result in terms of LVEF and 6-minute walking distance than the control group ($P < 0.05$, **Table 1** and **Figure 4**).

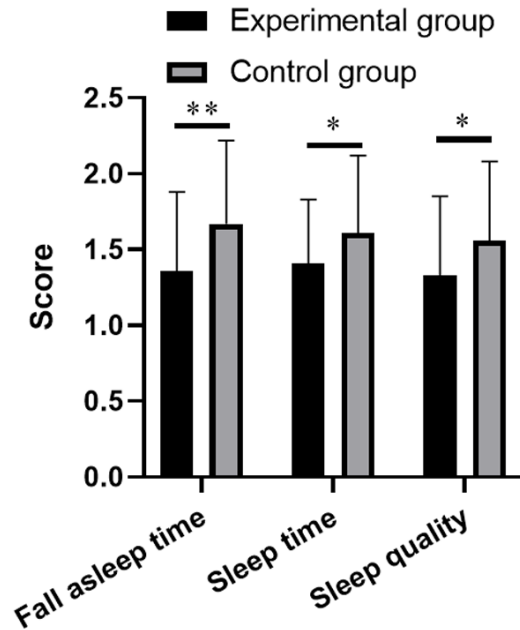


Figure 3. Comparison of the sleep quality scores of two groups. *indicates $P < 0.05$; **indicated $P < 0.01$.

Comparison of the blood pressure and serum lipid between the two groups

Before intervention, no significant differences in SBP, DBP, TC, and TG in the two groups were detected ($P < 0.05$). After intervention, the physiological indexes of SBP, DBP, TC, and TG in the two groups decreased, with a lower result in the experimental group than the control group ($P < 0.05$). (**Tables 2** and **3**).

Comparison of treatment compliance, incidence of adverse reactions, and effective rate between the two groups

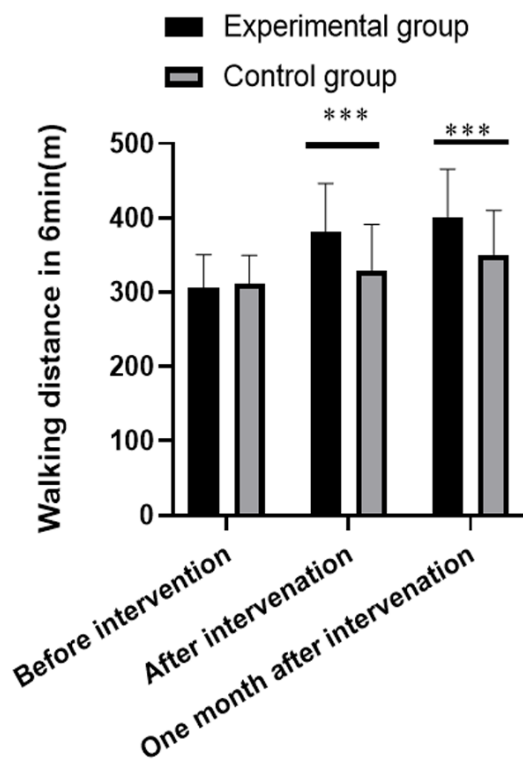
The patients in the experimental group enjoyed better medication compliance, exercise compliance, and dietary compliance than the control group ($P < 0.05$, **Table 4**). Patients in the experimental group suffered fewer adverse reactions than the control group ($P < 0.05$, **Table 5**). The effectiveness rate in the experimental group was much higher than that in the control group ($P < 0.05$, **Table 6**). Typical CHD angiography before and after intervention in the two groups is shown in **Figure 5**.

Discussion

The incidence of CHD is not only related to the patient's age but also interwoven with the

Table 1. Comparison of cardiac function and inflammatory indicators of two groups [n, (x ± s)]

Index	Time	Experimental group (n=50)	Control group (n=50)	t	P
LVEF (%)	The moment after intervention	45.41 ± 4.52	40.22 ± 4.43	5.798	0.001
	One month after intervention	43.78 ± 4.01	40.11 ± 3.44	2.455	0.002
LVEFDD (mm)	The moment after intervention	52.06 ± 4.31	60.03 ± 4.42	9.128	0.001
	One month after intervention	50.11 ± 3.65	59.74 ± 3.45	1.364	0.003
hs-CRP (mg/L)	Before treatment	6.19 ± 2.25	6.23 ± 2.14	2.369	0.639
	The moment after intervention	2.29 ± 1.18	3.51 ± 1.44	5.245	0.001
t		5.364	4.369		
P		0.001	0.001		
TNF-α (ng/L)	Before treatment	231.46 ± 59.23	228.58 ± 60.07	3.874	0.869
	The moment after intervention	93.17 ± 25.36	164.31 ± 42.75	3.987	0.002
t		5.698	7.412		
P		0.002	0.001		
IL-6 (ng/L)	Before treatment	151.37 ± 49.75	149.23 ± 52.08	7.485	0.759
	The moment after intervention	56.41 ± 12.36	75.04 ± 20.17	3.321	0.001
t		9.635	10.325		
P		0.001	0.003		
MMP-9 (ng/L)	Before treatment	93.01 ± 19.52	92.62 ± 20.69	5.697	0.848
	The moment after intervention	44.79 ± 12.40	53.86 ± 15.02	1.369	0.002
t		7.554	6.356		
P		0.002	0.004		

**Figure 4.** Comparison of the walking distance in 6 min of two groups. ***indicates $P < 0.001$.

patient's habits [16, 17]. Hence, in addition to targeted treatment for patients, appropriate nursing intervention should be carried out. Many patients with CHD are inclined to continue treatment outside the hospital after their condition is stable. However, a lack of guidance from professional medical staff hinders the recovery effect [18-20]. Continuous TCM nursing can effectively solve this problem by providing scientific guidance after patients are discharged from the hospital, and regularly monitoring the development of illness, and giving patients scientific and effective guidance through continuous follow-up [21, 22]. In the TCM nursing mode, the main principle is to adjust yin and yang, strengthen body resistance and eliminate evil, so as to improve the patient's blood circulation, increase the patient's immunity, and restore the patient's health.

In this study, the experimental group obtained lower scores of psychological stress and sleep quality than the control group ($P < 0.05$), which proved that continuous TCM nursing combined with atorvastatin treatment can effectively optimize patients' psychological status and sleep

Table 2. Comparison of blood pressure between the two groups

	Number of cases	SBP		DBP	
		Before intervention	After intervention	Before intervention	After intervention
Experimental group	50	156.45 ± 18.23	127.56 ± 12.36	100.25 ± 17.24	78.25 ± 15.42
Control group	50	157.92 ± 20.81	136.21 ± 15.32	104.36 ± 18.24	87.77 ± 13.27
t		0.376	3.107	1.158	3.309
P		0.708	0.002	0.250	0.001

Table 3. Comparison of serum lipids between the two groups

	Number of cases	TC		TG	
		Before intervention	After intervention	Before intervention	After intervention
Experimental group	50	4.93 ± 0.82	3.26 ± 0.42	2.57 ± 0.55	1.87 ± 0.32
Control group	50	5.01 ± 1.16	4.51 ± 0.35	2.61 ± 0.43	2.25 ± 0.39
t		0.398	16.170	0.405	5.326
P		0.691	<0.001	0.686	<0.001

Table 4. Comparison of treatment compliance between the two groups

Group	Number of cases	Medication compliance	Exercise compliance	Dietary compliance
Experimental group	50	84% (42/50)	80% (40/50)	88% (44/50)
Control group	50	62% (31/50)	54% (27/50)	64% (32/50)
X ²		6.139	7.644	7.895
P		0.013	0.006	0.005

Table 5. Comparison of the incidence of adverse reactions between two groups (n, %)

Group	Number of cases	Epigastric discomfort	Nausea and vomiting	Dizziness and headache	Total incidence rate
Experimental group	50	2% (1/50)	0 (0/50)	0 (0/50)	2% (1/50)
Control group	50	6% (3/50)	4% (2/50)	4% (2/50)	14% (7/50)
X ²		1.041	2.04	2.04	4.891
P		0.307	0.153	0.153	0.027

Table 6. Comparison of effectiveness rate of treatment between the two groups (n, %)

Group	Number of cases	Significantly effective rate	Effective rate	Ineffective rate	Total effective rate
Experimental group	50	70% (35/50)	26% (13/50)	4% (2/50)	96% (48/50)
Control group	50	40% (20/50)	40% (20/50)	20% (10/50)	80% (40/50)
X ²					6.06
P					0.014

quality. The experimental group garnered higher CQQC scores, compared with the control group ($P < 0.01$), which proved that continuous TCM nursing combined with atorvastatin can elevate the quality of life of patients. TCM believes that CHD is categorized into diseases of “chest obstruction” and “heartache”, with the main pathogenesis of congestion, Qi stag-

nation, and visceral disorders. Nursing staff under the instruction of continuous TCM care provided dietary guidance to the patients such as recommending food that replenishes Qi and Yin in accordance with their specific disease conditions, to ensure a sufficient daily intake of nutrients such as protein. Healthy and harmonious emotions can comfort the qi of the viscera,

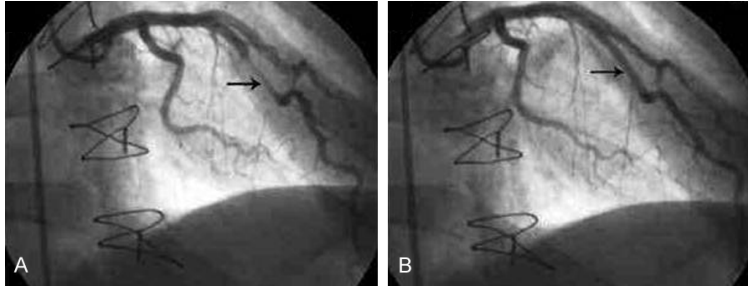


Figure 5. CHD angiography before and after intervention in the two groups. Note: (A) Before surgery; (B) After surgery.

and further promote the functional activities of the viscera. Otherwise, negative emotions invariably give rise to the dysfunction of qi and blood and eventually damage the viscera. Continuing TCM care strengthens communication with patients, diverts their attention from the disease, relieves their negative emotions, and helps establish a positive life attitude to enhance their confidence in the face of illness. After the intervention, the serum hs-CRP, TNF- α , IL-6, and MMP-9 levels of the two groups declined compared to those before treatment, and the results of the experimental group were lower than the control group. The levels of inflammatory factors reflect the instability of coronary plaque and are closely related to the occurrence of acute myocardial infarction. Epidemiologic evidence has proved that hs-CRP, a downstream inflammation marker, and TNF- α and IL-6, which are upstream inflammation markers, are significant predictors of cardiovascular risk. As MMP degrades fibrin, cap collagen, elastin, and other stable plaque components, plaques with MMP have a higher possibility to rupture and disintegrate. The degree of stability of AS plaques can be understood by the detection of the levels of related inflammatory factors, which can be employed as an important monitoring index for the clinical diagnosis, treatment, prediction, and prognosis of CHD. The influence on inflammatory factors may be one of the mechanisms of continuous TCM care to mitigate CHD, but a causal relationship needs to be further confirmed. The experimental group was lower in LVEFDD, SBP, DBP, serum TC, and serum TG than the control group, and the LVEF and 6-minute walking distance of patients in the experimental group was higher and longer than those in the control group ($P<0.05$). This indicates better cardiac function and also a superior recovery effect in

the experimental group. Strong evidence of a lower total incidence of adverse reactions in the experimental group was found, as compared to the control group ($P<0.05$). The rate of effective treatment and treatment compliance in the experimental group were higher than that of the control group ($P<0.05$). De-Mao Yi, Juan Zhang [23] et al. pointed out that the cardiac function index-

es of patients treated with continuous TCM nursing combined with atorvastatin tablets yield better therapeutic effect than those treated with atorvastatin tablets alone ($P<0.05$), which is in conformity with the results in this study.

This research changes the traditional nursing concept of CHD by optimizing the patients' moods and relieving their negative emotions such as worry, anxiety, and depression through the language, expression, posture, attitude, behavior, and temperament of the nursing staff. At the same time, it enhances the patients' confidence in the face of the disease, to achieve promising results in treatment. In this study, the decreased levels of inflammatory factors in the study group indicated a possible mechanism of continuous TCM care, which is the goal of future research. However, the most important limitation lies in the fact that this study is a single-center study with a small number of samples, short follow-up time, and no blinding method. This makes it less convincing in confirming the effect of continuous TCM nursing. In addition, there is no uniform operating standard for continuous TCM nursing, which reduces its popularization.

In sum, continuous TCM nursing combined with atorvastatin tablets yields a promising therapeutic effect on CHD, which can substantially ameliorate patients' psychological status, quality of life, and sleep quality, and reduce nurse-patient disputes.

Disclosure of conflict of interest

None.

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