

RESEARCH ARTICLE

Effect and safety of press-needle on chronic heart failure

Zhao Lizhi, Jiang Xiaoli, Gou Dongmei

Zhao Lizhi, Gou Dongmei, Department of Cardiology, the Traditional Chinese Medicine Affiliated Hospital of Southwest Medical University, Luzhou 646000, China

Jiang Xiaoli, Department of Cardiology, Yibin First People Hospital, Yibin 644000, China

Correspondence to: Prof. Jiang Xiaoli, Department of Cardiology, Yibin First People Hospital, Yibin 644000, China. 15183917187@163.com

Telephone: +86-8302583658

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Abstract

OBJECTIVE: To evaluate the effect and safety of the press-needle on chronic heart failure.

METHODS: According to the inclusion criteria and exclusion criteria, we screened 60 inpatients with chronic heart failure, from the Department of Cardiology in the Traditional Chinese Medicine Affiliated Hospital of Southwest Medical University, 60 cases were randomly divided into treatment group ($n = 30$) and control group ($n = 30$) in accordance with the random number table. The control group received standard Western Medicine treatment (according to the Chinese guidelines for the diagnosis and treatment of heart failure 2014 and patients' condition). The treatment group received the press-needle treatment on the basis of standard Western Medicine treatment, both treated for 3 months. Observing the 6 min walking distance (6 MWD), the score of Minnesota living with heart failure questionnaire (MLHFQ), N-terminal pro-brain natriuretic peptide (NT-proBNP), angiotensin II (Ang II), left ventricular ejection fraction (LVEF) before and after treatment.

RESULTS: No statistical differences were found be-

tween control group and treatment group at baseline. Through self-matching test before and after treatment, the observation indexes were improved ($P < 0.05$). When compared with control group, 6MWD increased, the MLHFQ, NT-proBNP, Ang II decreased in treatment group, and the difference was statistically significant ($P < 0.05$). There was no significant difference between the two groups regarding to LVEF ($P > 0.05$).

CONCLUSION: The treatment of press-needle can significantly improve exercise tolerance and quality of life of patients with chronic heart failure, but the improvement of left ventricular ejection fraction was not significant.

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Keywords: Heart failure; Angiotensin II; Exercise test; Quality of life; Press-needle

INTRODUCTION

Heart failure (HF), a clinical syndrome characterized by typical symptoms (such as breathlessness, ankle swelling, and fatigue), may be accompanied by signs (e.g. elevated jugular venous pressure, pulmonary crackles, and peripheral edema) caused by a structural and/or functional cardiac abnormality, which results in reduced cardiac output and/or elevated intracardiac pressure at rest or during stress. In developed countries, the prevalence of HF is approximately 1%-2% of the adult population, which rises to $\geq 10\%$ among people with the age of > 70 years.¹⁻⁴ The mortality of HF in each age group is higher than that of other cardiovascular diseases. Therefore, how to further improve the prognosis of HF deserves our efforts. Application of press-needle in Traditional Chinese Medicine (TCM) is quite common. Marked curative effects of press-needle

dle on hypertension⁵ and hyperlipidemia⁶ have also been shown in modern studies. This study was aimed to evaluate the effect and safety of press-needle in the treatment of Chronic HF.

MATERIALS AND METHODS

This was a single-center prospective cohort study designed to evaluate the effect and safety of press-needle for the treatment of chronic HF, which was approved by the local Ethical Committee. All participants in this study had provided the written informed consent to the scientific treatment.

Study population and follow-up

Sixty patients with chronic HF (NYHA class II-III) who came from the Traditional Chinese Medicine Affiliated Hospital of Southwest Medical University from September 2014 to September 2015 were enrolled in the study. The diagnosis was in accordance with the ESC Guidelines for the Diagnosis and Treatment of Acute and Chronic Heart Failure (2012).⁷ Sixty patients were randomly divided into treatment group and control group with the random number table, with 30 cases in each group. The inclusion criteria were as follows: patients with chronic heart failure of NYHA class II-III; 18 ≤ age ≤ 85; and informed consent. The exclusion criteria were as follows: patients with acute HF; acute exacerbation of chronic HF of NYHA class IV; rheumatic heart disease; congenital heart disease; second degree type II atrioventricular block, third degree atrioventricular block, sick sinus syndrome without a pacemaker; severe asthma and chronic obstructive pulmonary disease; pregnant or lactating women; severe liver and kidney dysfunction, as well as serious nerve, blood and sports system dysfunction; poor compliance; and patients who were allergic to press-needle. The primary end point was all-cause death. Patients were followed up to 3 months after treatment. Medical history and final outcomes were collected from hospital history records and during patient visits to hospital or by telephone interviews.

Therapies

Control group received standard Western Medicine treatments, including routine care, low salt and low fat diet, no smoking, and the necessity to limit sodium and water, as well as drug treatments. Drug treatments were given based on the Chinese Guidelines for the Diagnosis and Treatment of Heart Failure (2014)⁸ and patient conditions, which included ACEI/ARB, beta blockers, diuretics, and aldosterone receptor antagonists, etc. Treatment group received press-needle treatment on the basis of standard Western Medicine treatment, and the press-needles were embedded at Neiguan (PC 6), Shenmen (HT 7), and Zusanli (ST 36) acupoints. The embedded needles were pressed three to five times a day to improve the curative effects, and

they were retained in place for two days before they were taken out for one day, followed by a second embedding. All patients were treated for 3 months.

Measurement

Measures, such as the 6 min walking distance (6 MWD), Minnesota living with heart failure questionnaire (MLHFQ), NT-proBNP, Angiotensin II (Ang II), left ventricular ejection fraction (LVEF) before and after treatment were measured. Plasma NT-proBNP was detected by immunofluorescence test and Ang II radiation immunity analysis. LVEF was measured by professionals with the help of Siemens ACUSON SC2000 Color Doppler Echocardiographic Tester. Strenuous exercise should be avoided before the 6-min walk test, with the daily diet and medication. Made sure that the rescue measures had been ready and that the patients had known the purpose and method of the test. The test was performed according to a standardized procedure. Briefly, patients were asked to walk at their own maximal pace along a 30-m long, flat and straight hospital corridor. The test was symptom limited and was supervised by a physical therapist. The distance covered during the test was recorded in meters. The Minnesota Living with Heart Failure Questionnaire, a well-validated and popular tool used to assess the quality of life in HF patients, was comprised of 21 questions, including physical activity, as well as psychological and socioeconomic conditions. The lower the score was, the better the quality of life would be. All of these observation indexes were measured before treatment and after three-month of follow-up.

Statistical analysis

Data analyses were performed using SPSS 19.0 (IBM Corp., Released 2010, IBM SPSS Statistics for Windows, Version 19.0. Armonk, NY, USA: IBM Corp.). Quantitative data were presented as the mean ± standard deviation ($\bar{x} \pm s$), and qualitative data were presented as frequencies or percentages (%). *T*-test, or χ^2 test or Fisher's exact test was conducted to test the differences between groups when appropriate.

RESULTS

The baseline characteristics of patients were shown in Table 1, which demonstrated no statistical differences between control group and treatment group at baseline. As was indicated in Table 2, both groups had significantly prolonged 6MWT distance, reduced MLHFQ score, lowered NT-proBNP and Ang II levels, and increased LVEF after treatment ($P < 0.05$). Compared with control group, differences in improvements of 6 MWD, MLHFQ score, as well as NT-proBNP and Ang II levels in treatment group were statistically significant ($P < 0.05$). However, no significant difference was observed in LVEF between the two groups ($P > 0.05$). No obvious adverse reactions of press-needle

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