Int J Clin Exp Med 2015;8(6):9825-9829
www.ijcem.com /ISSN:1940-5901/IJCEM0007457

Original Article

The evaluation of clinical therapy effects of oral western medicine combined with magnetic pulse acupoint stimulation in treating elderly patients with coronary heart disease

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Received March 1, 2015; Accepted June 3, 2015; Epub June 15, 2015; Published June 30, 2015

Abstract: Objective: Treat the patients suffered from coronary heart disease with oral western medicine, combining with magnetic pulse acupoint stimulation, and observe the therapeutic effects of such combination therapy method. Methods: 56 old people with coronary heart disease are randomly divided into a treatment group and a control group. Both groups of patients are treated by the routine drugs, in addition, the patients of the treatment group are treated by magnetic pulse therapy additionally. Compare clinical symptoms, blood lipid and blood rheological indexes of the patients in the two groups when they are selected and after 30 days' treatment. Results: after 30 days' treatment, it is found that clinical symptoms, blood lipid and blood rheological indexes of the patients in the treatment group are significantly improved compared with those when they are selected and those of the control group ($P<0.05$). Conclusion: patients with coronary heart disease, treated by pulsed magnetic therapy and the conventional drug intervention, had relieved synptom, improve blood lipid and heart blood supply function.

Keywords: Oral western medicine, magnetic pulse therapy, coronary heart disease, myocardial ischemia, effect of treatment

Introduction

Coronary heart disease is a common disease and also one of frequently occurring diseases in the old people. As the aging population ratio increases gradually and the living environment changes, the incidence rate is increasing year by year. It seriously harms the physical and mental health of the old people, thus the prevention and cure of coronary heart disease has become one of the focuses in clinical study [1, 2]. In recent years, the international institutes have paid much attention to study foundation and application of magnetic field biological effect and the therapeutic effect of magnetic field has gradually aroused people's attention. A large number of studies show that the magnetic field has the therapeutic effect on hypertension and coronary heart disease and other cardiovascular diseases [3, 4]. Based on the above background, in this study, the coronary heart disease patients are treated by magnetic pulse therapy in addition to the conventional drug therapy. It is found that after 2 courses' treatment, clinical symptoms, blood lipid and blood rheology indexes of the patients are significantly improved and the clinical effect is satisfactory. It is reported as follows:

Objects and methods

Study object

56 patients with coronary heart disease, who are hospitalized in the First Affiliated Hospital, Zhengzhou University Hospitals, are selected. All of them comply with relevant standards of coronary heart disease in *Nomenclature and Diagnosis Criteria for Ischemic Heart Disease* and *New Medicine Clinical Study Guiding*

Table 1. Characteristics of the selected patients in two groups ($\bar{x}$±s)

Group	Number of patients	Sex (male/ female)	Age (years old)	Duration of disease history (Month)	Ischemic cardiomyopathy (Patient) (n, %)	Angina pectoris (Patient) (n, %)
Control group	28	15/13	60.0±8.6	13.25±6.34	17 (60.7)	11 (39.3)
Treatment group	28	16/12	61.2±7.8	14.50±6.21	15 (53.6)	13 (46.4)

Note: P>0.05.

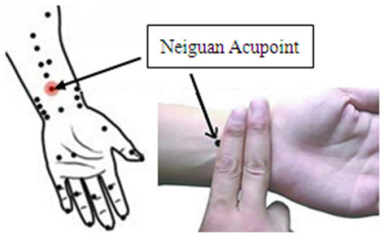

Figure 1. The position picture of Neiguan Acupoint. In the view of traditional Chinese medicine believes: The Neiguan Acupoint are the nervous acupoints governing the hearts, therapy of such acupoints can dredge the nerves of heart, and which can play the effect of promoting flow of qi and blood circulation, having evident opsonization to the patients with heart disease having the symptoms of cardiodynia, palpitation, and chest pain etc.

Principle in Traditional Chinese Medicine. The exclusion criteria of the patients include: upon the examination, patients are confirmed to suffer from acute myocardial infarction and other heart diseases, accompanied with acute hypertension, severe cardiopulmonary insufficiency and severe arrhythmia; or the efficacy can not be judged because patients are treated on the basis of the provisions or the patients without complete data. Adopt the random numerical table method to divide the above patients into the treatment group and the control group. The general situation and disease conditions for 2 groups of patients are shown in **Table 1**. Upon statistical comparison of data in the Table, it is found that differences between groups has not statistical significance (P>0.05). They are comparable.

Treatment method

2 groups of patients are treated by the routine drugs, including: 10 mg isosorbide dinitrate, 3 times daily; 60 mg aspirin, once a day. The treatment group is treated by magnetic pulse interference on the aforesaid basis. Select BL-H type magnetic pulse therapeutic instrument. In the treatment, the pulse wave paster is placed on near acupoint neiguan (See **Figure 1**). According to the sensitivity of the patients on the pulse wave, adjust the pulse intensity of the treatment instrument. Generally, strength of the magnetic field is set to 400-800 mT and the pulse field frequency is 40-80 times/min. Use such instrument to treat patients for 20-30 min. twice a day (Morning and evening). 1 treatment course lasts 15 days. Patients in two groups are treated for 2 consecutive treatment courses.

Evaluation of clinical efficacy

For angina and ECG improvement of patients before and after treatment, refer to Coronary Heart Disease Angina and ECG Efficacy Evaluation Standard. The specific scoring standards are listed as follows: 0 score if no obvious symptoms; 2 scores for mild symptoms; 4 scores for moderate symptoms; 6 scores for severe symptoms. The specific efficacy evaluation standards are listed as follows: significant efficacy: the clinical symptoms and signs are improved significantly, while decrease of symptom scores ≥70%; effective: the clinical symptoms and signs are improved, while decrease of symptom scores ≥30%; invalid: clinical symptoms and signs are not improved obviously or they are worsened, while decrease of symptom scores <30%; additionally, in the study, blood lipid and blood rheology indexes are evaluated before and after treatment for 2 groups of patients and them relevant data of two groups are compared.

Statistical analysis

Data from this study is expressed by ($\bar{x}$±s). Use SPSS 11.5 version statistical package to compare data and t test to compare measurement data and X^2 test to compare counting data. P<0.05 means that the difference has statistics significance.

Table 2. Comparison of clinical symptoms and efficacy between 2 groups of patients

Group	Number of patients	Significant efficacy (Patient)	Effective (Patient)	Invalid (Patient)	Total efficiency (%)
Treatment group	28	20	6	2	92.86
Control group	28	12	8	8	71.42

Z=2.356, *P*=0.018.

Table 3. Comparison of blood lipid for 2 groups of patients before and after treatment (mmol/L, $\bar{x}\pm s$)

Groups		Numbers	Triglyceride (TG)	Total cholesterol (TC)	Low density lipoprotein cholesterol (LDL-C)	High density lipoprotein cholesterol (HDL-C)
Treatment group	Before treatment	28	2.57±0.59	6.18±0.57	3.94±0.61	1.10±0.25
	After treatment	28	1.55±0.62	4.99±0.58	2.88±0.60	1.13±0.27
	F		36.840	58.574	34.349	0.171
	P		0.001	0.001	0.001	0.682
Control group	Before treatment	28	2.56±0.53	6.16±0.56	3.92±0.62	1.11±0.31
	After treatment	28	2.23±0.57	5.87±0.53	3.55±0.63	1.16±0.31
	F		4.259	4.222	6.774	0.567
	P		0.049	0.050	0.015	0.458
F			10.615	15.929	7.263	0.140

Table 4. Comparison of blood rheology indexes for 2 groups of patients before and after treatment ($\bar{x}\pm s$)

Groups		Numbers	Plasma viscosity (mpa.s)	Blood viscosity (mpa.s)	Fibrinogen (g/L)	Red blood cell backlog (%)
Treatment group	Before treatment	28	1.58±0.26	6.36±0.54	4.82±0.63	46.31±2.93
	After treatment	28	1.22±0.30	5.05±0.57	3.69±0.66	41.66±2.49
	F		25.548	72.549	59.235	46.450
	P		0.001	0.001	0.001	0.001
Control group	Before treatment	28	1.56±0.33	6.34±0.56	4.77±0.58	46.32±2.89
	After treatment	28	1.47±0.28	5.93±0.54	4.31±0.59	44.50±2.29
	F		1.059	6.850	9.118	6.346
	P		0.313	0.014	0.005	0.018
F			4.252	19.285	4.885	7.804
P			0.044	0.001	0.031	0.007

Results

After 2 groups of patients are treated for 2 courses (30 days in total), their clinical symptoms and efficacy results are shown in **Table 2**, while changes to blood lipid and blood rheology indexes are shown in **Tables 3**, **4**. Upon the statistic comparison, it is found that clinical symptoms, blood lipid and blood rheological indexes of the patients in the treatment group are significantly improved compared with those when they are selected and those of the control group ($P<0.05$), meanwhile, differences in and between groups have statistic significance ($P<0.05$).

A multivariate regression analysis was performed, in which the clinical effectiveness in the treatment group served as a dependent variable, as well as the clinical features including the sex, age and medical history and the blood lipid indexes and blood rheology indexes before treatment in the treatment group served as independent variables. The results showed

Table 5. Multi-factor analysis of the clinical effectiveness of the therapeutic regimen in this study

Variables	*β*	*OR*	*Wald*χ^2	P
Sex (male)	0.375	1.927	0.375	>0.05
Age	-0.615	0.667	4.637	<0.05
Medical history	-0.387	0.756	6.872	<0.05
TG	0.782	1.675	1.073	>0.05
TC	1.038	0.997	0.627	>0.05
LDL-C	-2.035	0.435	6.288	<0.05
HDL-C	1.675	2.527	7.775	<0.05
Plasma viscosity	0.638	1.039	0.367	>0.05
Blood viscosity	0.662	1.087	0.485	>0.05
FBG	-0.905	0.873	5.338	<0.05
Hct	-0.671	0.728	4.267	<0.05

that the clinical effectiveness in the treatment group was correlated (P<0.05) with the age (OR=0.667), medical history (OR=0.756), serum LDL-C level (OR=0.435), serum HDL-C (OR=2.527), plasma FBG level (OR=0.873) and plasma Hct level (OR=0.728). See **Table 5**.

Discussion

Coronary heart disease refers to myocardial dysfunction and (or) organ qualitative pathological change caused by coronary artery stenosis, insufficiency of blood supply, thus it is also called ischemic heart disease (IHD). Relevant studies show that coronary heart disease and the severity of myocardial ischemia is related to increase of blood viscosity induced by hyperfibrinogenemia and hyperlipidemia, thus regulation of blood fat and decrease of blood viscosity is one of the important measures in treatment of coronary heart disease [5-7].

At present, a large number of study reports show that magnetic pulse treatment has significant effect on the regulation of cardiovascular function, while it can prevent hypertension, reduce blood lipid, improve microcirculation, prevent atherosclerosis and coronary heart disease [8-10], for example, Vagin and so on [11] reports that by feeding high fat diet to New Zealand rabbits and subcutaneous burying of magnetic paster on Neiguan and Guanyuan points (The surface magnetic field strength: 110~140 mT), it observes their blood lipid changes after six months and then it finds that blood cholesterol and low density lipoprotein levels of experimental rabbits are significantly lower than those of the control group, additionally, the aortic intimal lipid deposition, plaques and intima thickness are obviously less than those of the control group. The study demonstrates that stimulus of the magnetic field on the acupuncture points has treatment effect on the arteriosclerosis.

It is found in a large number of basic and clinical studies that when the pulse current passes through the coil of the electromagnet, it can generate the pulse magnetic field with different frequencies and waveforms, meanwhile, the magnetic field strength varies with time. The magnetic field strength can be up to thousands of Gauss (Gs). Once it acts on the human body, it can dredge main and collateral channels, fasten blood circulation, improve nerve function and recover and regulate the body immunity. Additionally, it can not only expand the local vessels, but also increase circulation of blood and lymph fluid, thus it can improve the local tissue nutrition, promote cell metabolism as well as accelerate excretion and absorption of pathological product. For example, bio magnetic field effect, which is generated because the field effect magnetotherapy combines with the pulse wave, not only can regulate blood pressure and soften blood vessels, but also can reduce blood viscosity. It plays an important role in the inhibition of the heart and cerebrovascular accidents [12-15]; additionally, its effect on cardiovascular system is also very obvious. When the biological magnetic field acts on the human body reflection area (For example: near Neiguan point), it can change bioelectricity of smooth muscle cells in the narrow artery, as a result, expand blood vessels and enhance blood supply to the myocardium as well as help to restore normal blood supply of the heart tissue. For this reason, the coronary heart disease symptoms are alleviated [16-18]. Orlov [19] study results show that simple pulse magnetic field therapy has significant therapeutic effect on angina pectoris, meanwhile, the magnetic field can enhance the efficacy of anti angina drug.

This study results show that the differences of all indexes for 2 groups of subjects have not any statistic significance when they are selected, P>0.05; after 2 treatment courses, clinical symptoms, blood lipid and blood rheological indexes of the patients in the treatment group are significantly improved compared with those

when they are selected and those of the control group ($P<0.05$). It indicates that the old people with coronary heart disease are treated by pulse magnetic therapy in addition to the conventional drug intervention, it can further improve blood lipid level in the body and relieve disease. This therapy is worthy of clinical promotion and application.

Acknowledgements

Supported by Science and Technology Department of Henan Province, No. 112102310180.

Disclosure of conflict of interest

None.

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