

EFFECT OF TONGXINLUO CAPSULE COMBINED WITH METOPROLOL ON PRIMARY HYPERTENSION AND CORONARY HEART DISEASE, INFLUENCE ON HOMOCYSTEINE AND ENDOTHELIAL FUNCTION IN PATIENTS

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ABSTRACT

Objective: To investigate the effect of Tongxinluo capsule combined with metoprolol on primary hypertension and coronary heart disease, influence on homocysteine and endothelial function in patients.

Methods: A total of 128 cases of patients with primary hypertension and coronary heart disease admitted in our hospital from January 2016 to January 2018, were randomly divided into the observation group and the control group with 64 cases each group. The observation group was given Tongxinluo capsule combined with metoprolol, the control group was treated with metoprolol, the treatment lasted for 14d.

Results: The total effective rate of observation group was 92.19%, the control group was 75%, the observation group was significantly better than the control group ($P < 0.05$). The systolic pressure and diastolic pressure levels of two groups were significantly improved after treatment (The observation group: $t = 19.5375, 16.4710$, The control group: $t = 12.6305, 7.7504$, $P < 0.05$). The systolic pressure and diastolic pressure levels of observation group was significantly lower than the control group ($t = 8.8298, 8.1838$, $P < 0.05$). After treatment. The incidence and duration of angina in two groups were significantly lower, (the observation group: $t = 20.2237, 23.7450$, the control group: $t = 19.8862, 14.8211$, $P < 0.05$). The incidence and duration of angina in the observation group was significantly lower than the control group ($t = 13.5451, 15.4837$, $P < 0.05$). After treatment, homocysteine levels of two groups were significantly lower (the observation group: $t = 21.1313$, the control group: $t = 9.0159$, $P < 0.05$). Homocysteine levels of the observation group was significantly lower than the control group ($t = 12.7706$, $P < 0.05$). After treatment, ET-1 level reduce when NO level increase (the observation group: $t = 32.3946, 27.9182$, the control group: $t = 14.1317, 13.6478$, $P < 0.05$); ET-1 level of the observation group was lower than the control group, when NO level of the observation group was higher than the control group ($t = 18.4665, 12.7838$, $P < 0.05$).

Conclusion: The effect of Tongxinluo capsule combined with metoprolol on primary hypertension and coronary heart disease has greater clinical benefit. It can reduce the homocysteine level and improve endothelial function, which has important research value.

Keywords: Tongxinluo capsule, Metoprolol, Primary hypertension, Coronary Heart disease, Efficacy, Homocysteine, Endothelial function.

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Introduction

Primary hypertension is a common disease, and its incidence is on the rise, seriously affecting people's quality of life⁽¹⁾. At present, the causes of primary hypertension have not been clearly elucidated, which is believed to be mainly due to the interplay of genes and various acquired factors⁽²⁾. Coronary heart disease is mainly a kind of heart disease caused by coronary artery function and/or coronary atherosclerosis resulting in myocardial

ischemia or necrosis⁽³⁾. Primary hypertension with coronary heart disease is in serious condition. Hypertension can made coronary atherosclerosis, thus causing angina pectoris and other symptoms in patients, such as sudden cardiac death and acute myocardial infarction⁽⁴⁻⁶⁾. Therefore, it is particularly important to take timely and effective treatment of primary hypertension with coronary heart disease. The purpose of this study was to explore the effect of Tongxinluo capsule combined with metoprolol on primary hypertension with coronary heart dis-

ease, influence on homocysteine and endothelial function in patients.

Materials and methods

Clinical material

A total of 128 cases of patients with primary hypertension and coronary heart disease were admitted in our hospital from January 2016 to January 2018. Patients were diagnosed with primary hypertension according to Hypertension Prevention and Cure Guideline of China. Patients were diagnosed with coronary heart disease according to Name and diagnostic criteria of ischemic heart disease. The patients were randomly divided into observation group and control group with 64 cases each group. In the observation group, 38 males, 26 females, with an average age of (62.34 ± 5.67) years, the mean disease course of primary hypertension was (5.49 ± 1.43) years; In the control group, 39 males, 25 females, with an average age of (63.57 ± 4.98) years, the mean disease course of primary hypertension was (5.60 ± 1.42) years. Statistical analysis showed age, gender and other aspects in two groups no statistical difference.

Inclusion and exclusion criteria

Inclusion criteria:

- meet the diagnostic criteria of primary hypertension and coronary heart disease;

- signed informed consent of the research

Exclusion criteria: (1) Secondary hypertension; (2) People with abnormal pulmonary, kidney, liver function;

- Mental disease;
- Allergic constitution.

Treatment

Two groups were given oxygen intake, rest, low-fat diet, atorvastatin calcium tablets and aspirin after admission. The control group: oral metoprolol tartrate (Manufacturer: Jiangsu Meitong pharmaceutical co., LTD. Approval number: H32025116) 12.5mg/time, 3 times per day; The observation group: combined with Tongxinluo capsule on the basis of the control group (Manufacturer: Shijiazhuang Yiling Pharmaceutical Co., Ltd; Approval number: Z19980015) 3 pills/time, 3 times per day. Treatment was 14 d in two groups.

Observation index

- Compared with the systolic pressure and di-

astolic pressure levels of two groups before and after treatment;

- Compared with the incidence and duration of angina in two groups before and after treatment;

- Compared with homocysteine levels of two groups before and after treatment. Before and after treatment, extract peripheral venous blood 3 mL, respectively, with a radius of 15 cm, centrifuge for 10 min, save for -20°C , the homocysteine levels was detected by enzymatic cycling assay; (4) Compared with endothelial function of two groups before and after treatment. Before and after treatment, extract peripheral venous blood 3 mL, respectively, with a radius of 15 cm, centrifuge for 10 min, save for -20°C , the content of endothelin-1 (ET-1) and nitric oxide (NO) were detected by enzymatic cycling assay.

Curative effect standard⁽⁹⁾

- *Significant Effectivity:* decline range of diastolic pressure ≥ 10 mmHg within the normal range, and decline range of the incidence of angina pectoris $\geq 80\%$ within 1 week.

- *Effectivity:* decline range of diastolic pressure ≤ 10 mmHg within the normal range, and decline range of the incidence of angina pectoris 50%~80% within 1 week.

- *Invalid:* there was no change in diastolic pressure and angina. Total effective rate = (the cases of significant effectivity + the cases of effectivity)/total cases $\times 100\%$.

Statistical analysis

Data were analyzed by SPSS 19.0. Chi-squared test and t-test method were used for data analysis. $P < 0.05$ was considered statistically significant.

Results

Compared with curative effect in two group

The total effective rate of the observation group was 92.19%, the control group was 75%, the observation group was significantly better than the control group ($P > 0.05$) (Table 1).

Compared with the systolic pressure and diastolic pressure levels of two groups before and after treatment

The systolic pressure and diastolic pressure levels of two groups were no statistical difference before treatment ($t = 0.1575, 0.6797, P > 0.05$).

The systolic pressure and diastolic pressure levels of two groups were significantly improved after treatment (the observation group: $t=19.5375, 16.4710$, the control group: $t=12.6305, 7.7504$, $P<0.05$); The systolic pressure and diastolic pressure levels of observation group was significantly lower than the control group after treatment ($t=8.8298, 8.1838$, $P<0.05$) (Table 2).

Groups	Cases	Significant Effectivity %	Effectivity %	Invalid %	Total effective rate %
The observation group	64	37(57.81)	22(34.38)	5(7.81)	59(92.19)
The control group	64	25(39.06)	23(35.94)	16(25.00)	48(75.00)
χ^2	-	-	-	-	6.8927
P	-	-	-	-	<0.05

Table 1: Compared with curative effect in two group.

Groups		Cases	Systolic pressure (mmHg)	Diastolic pressure (mmHg)
The observation group	Before treatment	64	168.59±15.42	98.47±6.61
	After treatment	64	128.39±5.76**	82.39±4.16**
The control group	Before treatment	64	169.03±16.17	97.68±6.54
	After treatment	64	139.98±8.78*	89.42±5.47*

Table 2: Compared with the systolic pressure and diastolic pressure levels of two groups before and after treatment ($\bar{x} \pm s$).

Compared with the incidence and duration of angina in two groups before and after treatment

The incidence and duration of angina in two groups were no statistical difference before treatment ($t=0.4544, 0.0986$, $P>0.05$). After treatment, the incidence and duration of angina in two groups were significantly lower. (the observation group: $t=20.2237, 23.7450$, the control group: $t=19.8862, 14.8211$, $P<0.05$). The incidence and duration of angina in the observation group were significantly lower than the control group ($t=13.5451, 15.4837$, $P<0.05$) (Table 3).

Groups		Cases	The incidence of angina (times/week)	The duration of angina (min/times)
The observation group	Before treatment	64	15.47±3.41	8.09±1.68
	After treatment	64	6.28±1.26**	2.92±0.46**

Table 3: Compared with the incidence and duration of angina in two groups before and after treatment ($\bar{x} \pm s$).

Compared with homocysteine levels of two groups before and after treatment

Homocysteine levels of two groups were no statistical difference before treatment ($t=0.4573$, $P>0.05$). After treatment, homocysteine levels of

two groups were significantly lower (the observation group: $t=21.1313$, the control group: $t=9.0159$, $P<0.05$); Homocysteine levels of the observation group was significantly lower than the control group ($t=12.7706$, $P<0.05$) (Table 4).

Groups		Cases	Hcy ($\mu\text{mol/L}$)
The observation group	Before treatment	64	21.74±3.46
	After treatment	64	10.98±2.15**
The control group	Before treatment	64	22.03±3.71
	After treatment	64	16.73±2.89*

Table 4: Compared with homocysteine levels of two groups before and after treatment ($\bar{x} \pm s$).

Compared with endothelial function of two groups before and after treatment

ET-1 and NO level of two groups were no statistical difference before treatment ($t=0.8292, 0.7801$, $P>0.05$); after treatment, ET-1 level reduce when NO level increase (the observation group: $t=32.3946, 27.9182$, the control group: $t=14.1317, 13.6478$, $P<0.05$); ET-1 level of the observation group was lower than the control group, when NO level of the observation group was higher than the control group ($t=18.4665, 12.7838$, $P<0.05$) (Table 5).

Groups		Cases	ET-1 (ng/L)	NO ($\mu\text{mol/L}$)
The observation group	Before treatment	64	78.59±4.78	42.37±4.68
	After treatment	64	54.31±3.62**	70.52±6.57**
The control group	Before treatment	64	79.31±5.04	43.05±5.17
	After treatment	64	67.48±4.41*	56.42±5.89

Table 5: Compared with endothelial function of two groups before and after treatment ($\bar{x} \pm s$).

Discussion

In recent years, there have been many domestic studies on primary hypertension and coronary heart disease, and it is a hot topic in cardiovascular research. It is particularly important to explore an effective, scientific and safe therapy⁽¹⁰⁻¹¹⁾. Metoprolol tartrate is a kind of β_1 -adrenergic receptor blocker, which can selectively block β_1 receptor, increase the sensitivity of vascular smooth muscle to vascular medium, inhibit the secretion of renin, so as to achieve the antihypertensive effect⁽¹²⁾.

In addition, metoprolol tartrate can also block β receptor, reduce myocardial contractility and cardiac output, and reduce myocardial oxygen consumption⁽¹³⁾. Tongxinluo capsule is a pure traditional Chinese medicine preparation, mainly

composed of scorpion, ginseng, red peony, eupolyphaga, dalbergia odorifera, borneol, leech, and so on, which has the beneficial effect of enriching qi and activating blood, dredging collaterals and relieving pain. Modern pharmacological studies have shown that Tongxinluo capsule could increase coronary flow reserve and reduce blood fat, could inhibit thromboxane A2 and promote the synthesis of prostaglandin, could improve endothelial function to reduce blood pressure and coronary heart disease⁽¹⁴⁻¹⁵⁾.

In this study, the total effective rate in the observation group was higher than that in the control group, indicating that Tongxinluo capsule combined with metoprolol could improve the curative effect. Systolic pressure and diastolic pressure were lower in the observation group than that in the control group after treatment, indicating that Tongxinluo capsule combined with metoprolol could reduce blood pressure. The times of angina pectoris attack and duration of the observation group were lower than the control group, indicating that Tongxinluo capsule combined with metoprolol could reduce the incidence and duration of angina. Homocysteine is a sulfur containing amino acid. High homocysteine is a risk factor for atherosclerosis and related complications. According to the survey, the risk of hypertension with high homocysteine was 10.3 times higher than healthy human. The atherosclerosis caused by the increase of homocysteine is mainly due to its ability to produce free radicals through oxidation, resulting in vascular endothelium cells injury, inhibiting the synthesis of prostaglandin and NO, and causing hypertension. Fas molecules in vascular endothelial cells can be upregulated to increase ET-1, leading to dysfunction of vascular endothelial cells⁽¹⁶⁾.

Studies have reported that homocysteine content of patients with primary hypertension and coronary heart disease was significantly higher than that of healthy human⁽¹⁷⁾. In this study, the results indicated that homocysteine content in plasma of the observation group was lower than the control group after treatment, indicating that Tongxinluo capsule combined with metoprolol could reduce homocysteine content. Vascular endothelial cells could resist inflammation and resist thrombosis, inhibiting smooth muscle cell proliferation and regulating vascular tone. NO is an important cardiovascular system regulatory substance secreted by vascular endothelial cells, inhibiting ET-1 synthesis, inhibiting monocyte adhesion to endothe-

lial cells, inhibiting smooth muscle proliferation, inhibiting platelet aggregation, dilating blood vessels and stabilizing carotid artery atherosclerosis plaque⁽¹⁹⁾. ET-1 is an important regulator of cardiovascular system secreted by vascular endothelial cells and the strongest vasoconstrictor, which plays an important role in regulating cardiovascular system homeostasis and tension. Increased ET-1 levels can cause vasoconstriction and even spasm, while increased blood pressure or causing reflectivity heart rate inhibition may aggravate target organ hypoxic-ischemic⁽²⁰⁾. In this study, the results indicated that ET-1 level of the observation group was lower than the control group, when NO level of the observation group was higher than the control group, indicating that Tongxinluo capsule combined with metoprolol could improve endothelial function by reducing ET-1 and increasing NO. Therefore, the effect of Tongxinluo capsule combined with metoprolol on primary hypertension and coronary heart disease has greater clinical benefit. It can reduce the homocysteine level and improve endothelial function, which has important research value.

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