

Effect of *Jiawei qingxuan jiangya* decoction on blood pressure variability and sex hormone levels in perimenopausal female patients with hypertension

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Abstract: To explore the effect of *Jiawei Qingxuan Jiangya* Decoction on blood pressure variability and sex hormone levels in perimenopausal women with hypertension. A total of 400 perimenopausal female hypertensive patients admitted to the hospital from June 2019 to June 2020 were randomly divided into observation group and control group, with 200 cases in each group. The patients in the control group took orally benazepril hydrochloride tablets, and the observation group was added with *Jiawei Qingxuan Jiangya* Decoction on the basis of the control group. The course of treatment was 1 month. The clinical efficacy of the two groups and the 24h blood pressure variability (BPV) and sex hormone levels before and after treatment were compared. The total effective rate of the observation group was significantly higher than that of the control group ($P<0.05$); the 24h BPV of the two groups after treatment was significantly lower than that before the treatment, and the reduction in the observation group was greater ($P<0.05$); the serum estradiol in the observation group after treatment was significantly increased, and the level of follicle stimulating hormone was significantly reduced, and compared with the control group after treatment, the difference was statistically significant ($P<0.05$). *Jiawei Qingxuan Jiangya* Decoction for treating hypertension in perimenopausal women can effectively reduce blood pressure, improve short-term blood pressure variability, regulate sex hormone levels to a certain extent, and correct endocrine disorders. It is worthy of clinical promotion.

Keywords: *Jiawei qingxuan jiangya*, online health education, hypertension, management.

INTRODUCTION

Hypertension is one of the most common chronic diseases in human beings, which often causes cardiovascular and cerebrovascular complications (Sverre *et al.*, 2013). According to statistics, the number of people suffering from hypertension in China has exceeded 330 million, among whom the prevalence rate of adults can reach 33.5% (Ning., 2020). At present, the three-level management mode is used to control hypertension in China. Due to the most patients are old, have poor compliance and lack of self-attention, the blood pressure control situation is not ideal (Ley *et al.*, 2013). and because the early clinical symptoms of hypertension are not obvious, some patients fail to attract enough attention, The disease is usually an independent risk factor for stroke and can also lead to the occurrence of a variety of cardiovascular and cerebrovascular diseases. Menopausal women are in a special period of neuro-endocrine dysfunction. Such hypertensive patients may not have a significant increase in blood pressure, but their blood pressure fluctuates greatly, often accompanied by symptoms such as irritability, extreme agitation and insomnia, which seriously affect their lives quality (Shi *et al.*, 2019). Traditional Chinese medicine itself has outstanding performance in improving women's postmenopausal symptoms and high blood pressure (Zhang *et al.*, 2017). A large number of studies have

shown that the syndromes of deficiency of liver and kidney *yin* and hyperactivity of liver yang are not only the main syndromes of hypertension, but also the main syndromes of hypertension in menopausal women (Li *et al.*, 2019). *Qingxuan Jiangya* Decoction is an empirical formula that Academician Chen Keji and others have compiled and studied more than 30,000 original files in the Forbidden City, combined with his own years of clinical experience. Modern pharmacological research has found that *Qingxuan Jiangya* Decoction not only has a certain antihypertensive effect (Tian, 2018), also has a regulatory effect on sex hormone levels (Song, 2018). *Jiawei Qingxuan Jiangya* Decoction adds turtle version and dendrobium on the basis of the original prescription, which is more suitable for the treatment of hypertension of *Yin* deficiency and *Yang* hyperactivity. Clinically, angiotensin converting enzyme inhibitor (ACEI) plays an important role in the treatment of hypertension. It can not only effectively lower blood pressure, but also has a good target organ protection function. Benazepril hydrochloride tablets are commonly used second-generation ACEIs containing carboxyl groups. After oral administration, they can expand blood vessels, lower blood pressure, reduce cardiac load and improve blood perfusion (Khalid AM *et al.*, 2018). Therefore, in this study, Benazepril hydrochloride tablets were used as a routine treatment for hypertension and set as a control group, and the clinical efficacy of *Jiawei Qingxuan Jiangya* Decoction combined with Western medicine Benazepril Hydrochloride Tablets

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in the treatment of hypertension in perimenopausal women was analyzed. The report is as follows.

MATERIALS AND METHODS

General information

A total of 400 perimenopausal female hypertensive patients admitted to the hospital from June 2019 to June 2020 were randomly divided into observation group and control group, with 200 cases in each group. The average age of the observation group was (49.22±3.36) years, the course of disease was (5.34±0.78) years, the body mass index (BMI) was (25.39±2.12) kg/m² and the systolic blood pressure was (164.31±12.42) mmHg, the diastolic blood pressure is (91.23±8.25) mmHg. The average age of the control group was (48.97±3.41) years, the course of disease was (5.28±0.82) years, BMI was (26.11±2.25) kg/m², systolic blood pressure was (165.23±12.45) mmHg, and diastolic blood pressure was (90.48±8.27) mmHg. There was no significant difference in age, course of disease, BMI, systolic blood pressure, and diastolic blood pressure between the two groups (P>0.05). The study was approved by the Yuncheng Central Hospital ethics committee (approval no. 20190378) and the patients signed an informed consent form.

Inclusion criteria: (1) Perimenopausal women aged 40-60; (2) It met the diagnostic criteria of "Chinese Expert Consensus on Diagnosis and Treatment of Elderly Hypertension (2017 Edition)" (Li *et al.*, 2018); (3) Meet the dialectical standard of *Yin* deficiency and *Yang* hyperactivity in TCM (Li *et al.*, 2018); (4) Receiving medication; (5) Patients were equipped with smart phones and could be used proficiently.

Exclusion criteria: (1) Secondary hypertension; (2) Dysfunction of the heart, liver, kidney and other organs; (3) Lack of basic clinical data; (4) Those who could not take care of themselves; (5) The resident hospital was far away and the transportation was inconvenient.

Methods

The patients in the control group took orally benazepril hydrochloride tablets (Beijing Novartis Pharmaceutical Co., Ltd., SFDA approval no. B14202001421), 10 mg/time, once a day. The observation group was added with *Jiawei Qingxuan Jiangya* Decoction on the basis of the control group. The prescription consisted of Kudingcha 30g, Gastrodia 30g, Uncaria 30g, Scutellaria baicalensis 10g, Achyranthes bidentata 10g, Raw Eucommia 10g, http://www.youdao.com/w/tuber_fleece_flower_stem/ \1 "keyfrom=E2 Ctranslation" tuber fleece flower stem 30g, and Fresh Rehmannia 30g, 15g mulberry leaf, 15g chrysanthemum, 6g tortoise shell, and 6g dendrobium. It is decocted in the hospital's traditional Chinese medicine preparation room. One dose per day, 200mL each morning and evening, and warmly administered. The course of treatment is 1 month.

Observational index

(1) Clinical efficacy: According to the evaluation standard of clinical efficacy of hypertension (Zheng, 2021), after treatment, markedly effective is considered if blood pressure is controlled at a normal level or reduces by ≥20mmHg and clinical symptoms have basically disappeared; effective is deemed if blood pressure after treatment reduces by 10-20mmHg and clinical symptoms have improved; ineffective is defined if blood pressure is poorly controlled after treatment, clinical symptoms still exist.

(2) Blood pressure variability (BPV): The patient's blood pressure was dynamically monitored for 24 hours before and after treatment and the standard deviation was calculated.

(3) Sex hormone level: The patient's fasting peripheral venous blood was drawn before and after treatment, and the serum estradiol (E2), progesterone (P) and follicle stimulating hormone (FSH) were measured by an automatic biochemical analyzer.

STATISTICAL ANALYSIS

SPSS 21.0 software was used for statistical analysis. Enumeration data were expressed by case number (percentage), and χ^2 test was used for comparison between groups; Measurement data were expressed as mean ± standard deviation ($\bar{x} \pm s$), and t test was used for comparison between groups. Counting data were expressed by frequency or composition ratio, and examined using chi-square non-correction method. P<0.05 was considered statistically significant.

RESULTS

Comparison of clinical efficacy between the two groups

The total effective rate of the observation group was significantly higher than that of the control group (P<0.05) (table 1).

Comparison of blood pressure variability between the two groups

Before treatment, there was no statistically significant difference between the two groups of 24h BPV (P>0.05); after treatment, the 24h BPV of the two groups was significantly lower than that before treatment, and the reduction in the observation group was greater (P<0.05) (table 2).

Comparison of sex hormone levels between the two groups

Before treatment, there was no statistically significant difference in the levels of sex hormones between the two groups (P>0.05); after treatment, the serum E2 level in the observation group was significantly increased and the FSH level was significantly reduced, and compared with the control group after treatment, the difference was

Table 1: Comparison of clinical efficacy between the two groups

Groups	N	Markedly effective	Effective	Ineffective	Total effective rate
Observation group	200	112	70	18	182/91.00
Control group	200	84	70	46	154/77.00
χ^2					15.824
<i>P</i>					<0.01

Table 2: Comparison of blood pressure variability between the two groups

Groups	N	Time	BPV (mmHg)	
			Systolic blood pressure	Diastolic blood pressure
Observation group	200	Before treatment	23.72±4.38	18.79±3.07
		After treatment	11.41±2.82 [⊙]	9.49±2.36 [⊙]
Control group	200	Before treatment	24.39±4.13	19.28±3.13
		After treatment	16.22±2.78 [⊙]	13.54±2.47 [⊙]

Table 3: Comparison of sex hormone levels between the two groups

Groups	N	Time	E2 (pg/mL)	P (ng/mL)	FSH (mLu/mL)
Observation group	200	Before treatment	103.24±21.26	1.44±0.28	38.92±21.29
		After treatment	133.67±24.39 [⊙]	1.38±0.32	21.37±9.41 [⊙]
Control group	200	Before treatment	98.23±22.48	1.42±0.26	38.87±21.35
		After treatment	102.45±24.82	1.39±0.33	37.42±9.46

Note: Compared with the same group before treatment, [⊙]*P*<0.05; compared with the control group after treatment, [⊙]*P*<0.05

statistically significant (*P* <0.05). See table 3.

DISCUSSION

Hypertension in perimenopausal women is a common disease type in women, which seriously threatens the physical and mental health of female patients (Majnaric *et al.*, 2019). Clinically, benazepril is often used for treatment of this type of hypertension, but its therapeutic effect is not very significant (Liu., 2017). In traditional Chinese medicine, hypertension in perimenopausal women belongs to the category of "vertigo" and "headache". <http://www.youdao.com/w/The Inner Canon of Huangdi/> \ "keyfrom=E2Ctranslation" \ The Inner Canon of Huangdi \ " stated that (women) Qiqi, *Ren* pulse is empty, *Taichong* pulse is weak, *Tiangui* is exhausted, and thus the tube is impassable, then no child would be borne. Therefore, it is believed that the liver and kidney are the main cause of hypertension, and the treatment should be based on warming kidney *yang* and nourishing kidney *yin* (Fan *et al.*, 2018). *Qingxuan Jiangya* Decoction is made by academician Chen Keji's modified *Gastrodia* and *Uncaria Gastrodiae*. The prescription of *Gastrodia* and *Uncaria Gastrodiae* can tranquilize liver and *yang*. They are the monarch medicine; *Kudingcha*, *Scutellaria baicalensis* for clearing away heat and liver, mulberry leaves and chrysanthemum for clearing the head, *eucommia ulmoides*, fresh ground nourishing *yin* and nourishing kidneys, <http://www.youdao.com/w/tuber fleeceflower stem/> \ "keyfrom=E2Ctranslation" \ tuber

fleeceflower stem for nourishing the heart and soothing the mind, *Sichuan achyranthes bidentata* for dispelling wind and dampness, all medicines are used together to nourish *yin* and invigorate the kidney, tranquilize liver and *yang*. *Jiawei Qingxuan Jiangya* Decoction adds tortoise shell to nourish *yin* and *yang*, nourish the kidney and bones, nourish the heart and soothe the mind and *dendrobium* nourishes *yin* and clears away heat.

This study showed that the total effective rate (91.00%) of *Jiawei Qingxuan Jiangya* Decoction combined with benazepril hydrochloride tablets was significantly higher than the total effective rate of benazepril alone (77.00%), suggesting that the application of *Jiawei Qingxuan Jiangya* Decoction combined with Benazepril Hydrochloride Tablets in the treatment of perimenopausal female hypertensive patients can obtain satisfactory curative effects and has clinical applications value. The 24h blood pressure rhythm of normal people presents double peaks and double valleys, while patients with hypertension have short-term BPV (Alejandro *et al.*, 2021). Studies have shown that short-term BPV in hypertensive patients is an independent risk factor for cardiovascular and cerebrovascular diseases (Kang *et al.*, 2015). The results of this study show that the application of *Jiawei Qingxuan Jiangya* Decoction can effectively reduce the blood pressure of patients while also improving the short-term blood pressure variability. It indicates that the combination of *Jiawei Qingxuan Jiangya* Decoction and Benazepril can reduce blood pressure fluctuations during perimenopausal period, and

indirectly reduce the risk of cardiovascular and cerebrovascular events. In addition, this study also concluded that *Jiawei Qingxuan Jiangya* Decoction combined with Benazepril has a regulatory effect on sex hormone levels, especially E2 and FSH. On this basis, it plays the role of lowering blood pressure and relieving clinical symptoms. It is an effective compound for the treatment of hypertension of perimenopausal women with *Yin* deficiency and *Yang* hyperactivity.

CONCLUSION

In summary, *Jiawei Qingxuan Jiangya* Decoction for treating hypertension in perimenopausal women can effectively reduce blood pressure, improve short-term blood pressure variability, regulate sex hormone levels to a certain extent, and correct endocrine disorders. It is worthy of clinical promotion. However, there are still shortcomings in this study; for instance, we only discussed the short-term curative effect of *Jiawei Qingxuan Jiangya Decoction* combined with Benazepril hydrochloride tablets on the blood pressure of perimenopausal women with hypertension. Thus, the long-term stability after treatment will be analyzed in future studies.

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