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Observation on the Efficacy of Combined External Treatment of Traditional Chinese Medicine in Intervening Hypertension with Kidney-Yang Deficiency by Regulating the RASS System

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Abstract: *Objective:* To observe the efficacy of combined external treatment of traditional Chinese medicine (TCM) in intervening hypertension with kidney-Yang deficiency by regulating the RASS system. *Methods:* A total of 61 patients with subacute hypertension and kidney-Yang deficiency admitted to our hospital from December 2024 to March 2025 were selected. The western medicine treatment group was treated with amlodipine benzenesulfonate and instructed to take antihypertensive western medicine regularly. The TCM external treatment group received auricular acupuncture, auricular point pressing with beans, and acupoint application based on the treatment of the Western medicine group. Laboratory indicators (including angiotensin II, aldosterone, and renin), blood pressure changes, and TCM syndrome scores were compared between the two groups after 4 weeks of treatment. *Results:* After treatment, there were no statistically significant differences in angiotensin II, aldosterone, and renin between the TCM external treatment group and the Western medicine treatment group ($P < 0.05$). There was no statistical significance in blood pressure measurements from the 1st to the 8th time between the two groups ($P > 0.05$). However, both systolic and diastolic blood pressures in the TCM external treatment group showed statistically significant differences between the 8th and 1st measurements ($P < 0.05$), while only systolic blood pressure in the western medicine treatment group showed a statistically significant difference ($P < 0.05$). The blood pressure in the TCM external treatment group decreased steadily from the 1st to the 8th measurement, whereas it did not decrease significantly in the Western medicine treatment group. The TCM external treatment group had significantly better scores in terms of headache and dizziness, cold limbs or back, frequent or involuntary nocturia, fatigue and laziness to speak, shortness of breath and weakness, and other TCM syndromes compared to the control group ($P < 0.05$). *Conclusion:* The combination of TCM external treatment and Western medicine has a good antihypertensive effect in treating subacute hypertension with kidney-Yang deficiency and can effectively improve clinical symptoms.

Keywords: Traditional Chinese Medicine external treatment; Kidney-Yang deficiency; Hypertension

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1. Introduction

Hypertension is a common disease with high morbidity and mortality rates, and there is currently no definitive cure [1]. In recent years, due to factors such as socio-economic development and changes in lifestyle, the number of patients with subacute hypertension in China has been increasing, and the condition has become more complex and diverse, making treatment more challenging [2]. Clinically, patients with kidney-Yang deficiency hypertension experience symptoms such as headache and dizziness, cold limbs or back, frequent or involuntary nocturia, fatigue and laziness to speak, shortness of breath and weakness, spiritual malaise, pale and swollen tongue with tooth marks, white and slippery or greasy tongue coating, and deep, thin, weak, or floating pulses. To further understand the etiology and current treatment status of this disease, the author conducted a related observational study on 61 patients with kidney-Yang deficiency hypertension admitted to our hospital from December 2024 to March 2025. The results found that adding TCM external treatment on the basis of western medicine antihypertensive therapy can effectively relieve clinical symptoms and lower blood pressure levels, with significant efficacy. The report is as follows.

2. Materials and methods

2.1. General information

A total of 61 patients with subacute hypertension and kidney-Yang deficiency admitted to our hospital from December 2024 to March 2025 were selected. Exclusion criteria included: (1) patients with secondary hypertension; (2) patients with hypertension grade 3 or complicated with hypertensive encephalopathy, hypertensive crisis, and other critical illnesses; (3) patients aged < 20 or > 70 years; (4) patients with severe cardiovascular, liver, kidney, blood system, and neurological diseases; (5) patients with malignant tumors; (6) patients with mental illness; (7) pregnant or lactating women; (8) patients with poor compliance who did not take medication as prescribed. Diagnosis was based on the patients' clinical symptoms and signs. Among them, 31 patients were in the western medicine treatment group (18 males and 13 females), and 30 patients were in the TCM external treatment group (13 males and 17 females). There were no statistically significant differences in gender, hypertension grading, and hypertension-related indicators (angiotensin II, aldosterone, renin) between the two groups ($P > 0.05$), indicating comparability. See **Table 1** for details.

The diagnostic criteria for "kidney-Yang deficiency hypertension" in this study were developed based on the "Guiding Principles for Clinical Research of New Chinese Medicinal Drugs" [3]: (1) meet the western medical diagnostic criteria for hypertension, with hypertension graded as 1–2; (2) TCM syndrome differentiation as kidney-Yang deficiency; (3) aged 20–70 years; (4) patients who have provided informed consent and signed the informed consent form.

Table 1. Clinical data

Group		Traditional Chinese Medicine External Treatment Group (n = 30)	Western Medicine Treatment Group (n = 31)	t/χ^2	P
Gender	Male	13 (43.33)	18 (58.06)	1.324	> 0.05
	Female	17 (56.67)	13 (41.94)		
Hypertension Classification	Grade I	14 (46.67)	15 (48.39)	0.018	> 0.05
	Grade II	16 (53.33)	16 (51.61)		
Three Indices of Hypertension	Angiotensin II	48.99 ± 20.09	52.00 ± 18.41	0.610	> 0.05
	Aldosterone	137.84 ± 109.60	115.94 ± 72.95	0.922	> 0.05
	Renin	90.29 ± 226.81	20.97 ± 27.29	1.670	> 0.05

2.2. Methods

The Western medicine treatment group was given amlodipine besylate treatment, and patients were instructed to regularly take Western medicine to lower blood pressure. The external treatment group of traditional Chinese medicine was treated with external treatment of traditional Chinese medicine on the basis of the Western medicine treatment group. The main acupoints for moxibustion treatment were Baihui and ear acupoints, each time for twenty minutes. The main acupoints for auricular acupressure were: kidney, ear apex, liver, and hypotensor points, with supporting acupoints being: pillow, forehead, shenmen, and subcortex. Press 4–8 times a day, each acupoint for 5 minutes. 15–21 days is a course of treatment. Acupoint application uses powdered Eucommia ulmoides and cinnamon, mixed with vinegar, and applied to the Yongquan acupoint. The treatment course is 4 weeks.

2.3. Observation indicators

2.3.1. Detection of plasma renin activity (PRA), angiotensin II (Ang II), and aldosterone (ALD) levels

Both groups of patients had 3 mL of venous blood drawn in a fasting state, in a supine position, at 6 to 8 in the morning. PRA, Ang II, and ALD were quantitatively detected using antigen-antibody specific binding and enzyme substrate luminescence. The detection method strictly followed the instructions. Detection was performed once before treatment and once at the end of treatment.

2.3.2. Blood pressure measurement

Before measuring blood pressure, patients were asked to rest quietly for 15 minutes. Then, a standard mercury blood pressure monitor was used to measure blood pressure. Each measurement was taken three consecutive times, and the average of the three systolic and diastolic blood pressure readings was recorded. Measurements were taken before treatment, at the end of treatment, and twice a week during treatment. The dosage of antihypertensive drugs was adjusted based on blood pressure levels.

2.3.3. Traditional Chinese medicine syndrome score

Refer to the "Guiding Principles for the Clinical Research of New Chinese Medicines (Trial)" regarding vertigo, and use the traditional Chinese medicine syndrome rating scale to rate five main syndromes: headache and dizziness, cold limbs or back, frequent or involuntary urination at night, fatigue and laziness, and shortness of breath. The syndromes were rated on a scale of 0 to 3 (none, mild, moderate, severe). The higher the score, the more severe the condition, with a total score range of 0 to 15.

2.4. Statistical methods

SPSS 22.0 software was used for statistical analysis of the data. Measurement data were expressed as mean ± standard deviation (SD) and analyzed using the *t*-test. Count data were analyzed using the χ^2 test, and grade testing was performed using the Z-test. A P-value < 0.05 was considered statistically significant.

3. Results

3.1. Comparison of laboratory indicators between the two groups

There was no statistically significant difference in angiotensin II, aldosterone, and renin between the external treatment group of traditional Chinese medicine and the Western medicine treatment group ($P > 0.05$), as shown in **Table 2**.

Table 2. Comparison of laboratory indicators between the two groups (mean ± SD)

Group	Angiotensin II (pg/mL)	Aldosterone (pg/mL)	Renin (ulU/mL)
Traditional Chinese Medicine External Treatment Group (n = 30)	49.80 ± 18.25	105.23 ± 45.45	67.55 ± 182.36
Western Medicine Treatment Group (n = 31)	48.92 ± 21.23	107.50 ± 55.39	37.38 ± 64.63
t	0.173	0.175	0.867
P	> 0.05	> 0.05	> 0.05

3.2. Comparison of blood pressure changes between the two groups

There was no statistically significant difference in blood pressure measurements from the 1st to the 8th time between the external treatment group of traditional Chinese medicine and the Western medicine treatment group (P > 0.05). However, there was a statistically significant difference in both systolic and diastolic blood pressure in the external treatment group of traditional Chinese medicine when comparing the 8th measurement to the 1st (P < 0.05). In the Western medicine treatment group, there was a statistically significant difference in systolic blood pressure when comparing the 8th measurement to the 1st (P < 0.05), but no statistically significant difference in diastolic blood pressure (P > 0.05). Additionally, the external treatment group of traditional Chinese medicine showed a steady decrease in blood pressure from the 1st to the 8th measurement, while the decrease was not significant in the Western medicine treatment group. See **Table 3** for details.

Table 3. Comparison of blood pressure changes between the two groups (± SD, mmHg)

Group		Traditional Chinese Medicine External Treatment Group (n=30)	Western Medicine Treatment Group (n=31)	*t*	*P*
1st Measurement	Systolic Blood Pressure	145.13 ± 11.54	144.06 ± 16.80	0.289	> 0.05
	Diastolic Blood Pressure	89.40 ± 13.53	89.19 ± 15.23	0.056	> 0.05
2nd Measurement	Systolic Blood Pressure	141.37 ± 17.82	138.00 ± 10.57	0.901	> 0.05
	Diastolic Blood Pressure	88.133 ± 11.80	85.87 ± 10.54	0.791	> 0.05
3rd Measurement	Systolic Blood Pressure	141.600 ± 11.73	137.55 ± 10.98	1.392	> 0.05
	Diastolic Blood Pressure	88.433 ± 11.61	85.03 ± 10.49	1.201	> 0.05
4th Measurement	Systolic Blood Pressure	136.63 ± 14.17	136.45 ± 10.30	0.057	> 0.05
	Diastolic Blood Pressure	87.20 ± 11.21	84.97 ± 9.80	0.829	> 0.05
5th Measurement	Systolic Blood Pressure	134.47 ± 12.92	136.97 ± 10.04	0.846	> 0.05
	Diastolic Blood Pressure	85.67 ± 9.97	85.58 ± 9.26	0.035	> 0.05
6th Measurement	Systolic Blood Pressure	130.97 ± 14.14	136.10 ± 9.86	1.648	> 0.05
	Diastolic Blood Pressure	84.47 ± 9.17	85.13 ± 9.19	0.282	> 0.05
7th Measurement	Systolic Blood Pressure	132.60 ± 15.16	135.45 ± 9.43	0.885	> 0.05
	Diastolic Blood Pressure	84.84 ± 9.36	85.43 ± 10.06	0.239	> 0.05
8th Measurement	Systolic Blood Pressure	131.33 ± 16.13[a]	135.68 ± 10.20[a]	1.262	> 0.05
	Diastolic Blood Pressure	83.37 ± 8.45[b]	84.74 ± 9.20[b]	0.607	> 0.05
t		3.811[a] 2.071[b]	2.374[a] 1.393[b]		
P		0.000[a] 0.043[b]	0.021[a] > 0.05[b]		

Note: a and b represent the comparison of systolic and diastolic blood pressure, respectively, between the 8th and 1st measurements.

3.3. Comparison of traditional Chinese medicine syndrome scores between the two groups

The external treatment group of traditional Chinese medicine showed significantly better scores in traditional Chinese medicine syndromes such as headache and dizziness, cold limbs or back, frequent or involuntary urination at night, fatigue and laziness, and shortness of breath compared to the control group ($P < 0.05$). The difference was statistically significant, as shown in **Table 4**.

Table 4. Comparison of traditional Chinese medicine syndrome scores between the two groups (mean ± SD, points)

Group	Headache and Dizziness	Coldness in Limbs or Back	Frequent or Incontinent Nocturia	Fatigue and Lazy to Speak	Shortness of Breath and Weakness
External Treatment Group of Traditional Chinese Medicine ($n = 30$)	1.34 ± 0.67	1.21 ± 0.89	1.87 ± 0.54	1.98 ± 0.76	1.12 ± 0.93
Western Medicine Treatment Group ($n = 31$)	211 ± 0.72	2.54 ± 0.76	2.65 ± 0.68	2.45 ± 0.81	2.02 ± 1.02
t	4.327	3.128	5.221	2.543	3.876
P	0.000	0.002	0.000	0.013	0.000

4. Discussion

Hypertension refers to a condition where the blood pressure exceeds 140/90 mmHg (1 mmHg = 0.133 kPa) in three separate measurements taken on different days without the use of antihypertensive medications. The main clinical manifestations include dizziness, blurred vision, palpitations, insomnia, and elevated systemic arterial blood pressure (systolic and/or diastolic pressure) with systolic pressure greater than or equal to 140 mmHg and diastolic pressure greater than or equal to 90 mmHg [4]. The etiology of this disease is often attributed to deficiencies in kidney Yang energy, phlegm and blood stasis, and hyperactivity of liver Yang in traditional Chinese medicine. Currently, clinical treatments mainly include non-pharmacological and pharmacological therapies. Non-pharmacological therapies include physical exercise, psychotherapy, dietary control, etc., while pharmacological therapies primarily involve five major types of antihypertensive drugs [5]. Western medicine currently lacks effective treatments for hypertensive sub-emergencies, whereas traditional Chinese medicine, with its theoretical foundation of "seeking the root cause of the disease," possesses unique advantages in the treatment of hypertension [6]. Studies have shown that integrated traditional Chinese and Western medicine can better improve patients' clinical symptoms, blood pressure levels, and quality of life [7].

Hypertension falls under the categories of "headache" and "vertigo" in traditional Chinese medicine [8]. According to the "Ling Shu Jing Mai," various wind-induced tremors and vertigo are all attributed to the liver, indicating that liver and kidney deficiencies are significant factors causing dizziness and blurred vision. The "Su Wen Sheng Qi Tong Tian Lun" emphasizes the importance of Yang energy to the human body, stating that Yang energy dominates the exterior during the day, and its decline is associated with the rise of Yin energy. Insufficient kidney Yang energy can lead to improper warming of body fluids, resulting in water and dampness stagnation, abnormal qi transformation, and disrupted ascending and descending functions, ultimately causing elevated blood pressure. The primary treatment focuses on warming and nourishing the Yang, specifically targeting the kidneys. Clinically, hypertension is often treated from the perspective of the liver, using methods such as calming the liver and extinguishing wind or soothing the liver and purging fire. However, the efficacy of these treatments has been less than satisfactory. The liver is considered a Yang organ in traditional Chinese medicine, responsible for growth,

dispersion, regulation, and blood storage. It is closely related to the kidneys, giving rise to the saying "the liver and kidneys share the same origin." When kidney Yang deficiency is the root cause, and liver Yang hyperactivity is the manifestation, it leads to the formation of kidney Yang deficiency-type hypertensive disorder. Patients with this type may experience dizziness, vertigo, tinnitus, palpitations, soreness and weakness of waist and knees, frequent urination, clear urine, nocturia, pale tongue with white coating, and a thin and weak pulse. Kidney Yang deficiency is a fundamental pathological feature and an important cause of this disease.

The results of this study showed no statistically significant differences in angiotensin II, aldosterone, and renin levels between the external treatment group of traditional Chinese medicine and the Western medicine treatment group after treatment ($P < 0.05$). Additionally, there were no statistically significant differences in blood pressure measurements from the 1st to the 8th measurement between the two groups ($P > 0.05$). However, both systolic and diastolic blood pressures in the external treatment group of traditional Chinese medicine showed statistically significant differences when comparing the 8th measurement to the 1st ($P < 0.05$), while only systolic blood pressure in the Western medicine treatment group showed a statistically significant difference ($P < 0.05$). Moreover, the external treatment group of traditional Chinese medicine demonstrated a steady decrease in blood pressure from the 1st to the 8th measurement, whereas the decrease was not significant in the Western medicine treatment group. Furthermore, the external treatment group of traditional Chinese medicine had significantly better scores in symptoms such as headache, dizziness, cold limbs or back, frequent or involuntary urination at night, fatigue and laziness, and shortness of breath compared to the control group ($P < 0.05$). These findings suggest that external treatment methods in traditional Chinese medicine have a good therapeutic effect on kidney Yang deficiency-type hypertension with fewer side effects. This study indicates that the combination of external treatment methods in traditional Chinese medicine and Western medicine is significantly more effective than Western medicine alone, highlighting the high clinical value of integrated traditional Chinese and Western medicine in the treatment of kidney Yang deficiency-type hypertension. Compared to Western medicine alone, the combination of traditional Chinese and Western medicine can better control blood pressure levels without causing adverse reactions, demonstrating safety and efficacy. This conclusion is supported by literature citations [9,10]. Additionally, some scholars have pointed out that patients with kidney Yang deficiency-type hypertension can also be treated with methods such as soothing the liver and relieving depression, clearing heat and draining dampness, in addition to antihypertensive medications [11]. Moreover, it is recommended to appropriately increase physical activity and enhance nutrient intake based on individual differences among patients to achieve more ideal blood pressure-lowering effects.

As a relatively common treatment method, external treatment in traditional Chinese medicine has been widely used in the clinical treatment of hypertension in recent years, achieving good results and providing an important reference for the integrated treatment of hypertension with traditional Chinese and Western medicine [12,13]. However, it should be noted that due to the lack of a standardized clinical evaluation system for external treatment methods in traditional Chinese medicine, there is currently no unified standard for evaluating their efficacy. Therefore, clinical attention should be paid to exploring related issues to further clarify their clinical efficacy.

5. Conclusion

In summary, the combination of external treatment methods in traditional Chinese medicine and antihypertensive medications can achieve better therapeutic effects in patients with kidney Yang deficiency-type hypertension, with high safety, making it worthy of promotion and application.

Disclosure statement

The author declares no conflict of interest.

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