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Evaluation of the Effectiveness and Improvement of Quality of Life of Tianma Gouteng Decoction Combined with Betahistine Mesylate in Treating Posterior Circulation Ischemic Vertigo

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Abstract: *Objective*: To evaluate the therapeutic effect of Tianma Gouteng Decoction combined with Betahistine Mesylate in patients with posterior circulation ischemic vertigo (PCI). *Methods*: Eighty-two patients with PCI who visited the hospital from February 2024 to February 2025 were selected as samples and randomly divided into two groups. Group A received Tianma Gouteng Decoction combined with Betahistine Mesylate, while Group B received only Betahistine Mesylate. The efficacy, syndrome scores, hemodynamics, and quality of life indicators were compared between the two groups. *Results*: The efficacy of PCI treatment in Group A was higher than that in Group B ($P < 0.05$). The syndrome scores in Group A were lower than those in Group B ($P < 0.05$). The peak systolic velocity (PSV) of the basilar artery and left and right vertebral arteries in Group A were higher than those in Group B ($P < 0.05$). The quality of life (SF-36) score in Group A was higher than that in Group B ($P < 0.05$). *Conclusion*: Tianma Gouteng Decoction combined with Betahistine Mesylate is effective and feasible in the treatment of PCI, with improved hemodynamic indicators and reduced disease scores.

Keywords: Posterior circulation ischemic vertigo; Betahistine mesylate; Tianma Gouteng Decoction; Efficacy

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1. Introduction

PCI accounts for a relatively high proportion of neurological diseases and is related to blood circulation disorders in the vertebrobasilar artery system that block blood supply to the brainstem and thalamus. Symptomatic treatment of PCI in Western medicine corrects craniocerebral blood transport disorders, restores craniocerebral blood oxygen supply, and reduces PCI patient symptoms. Betahistine Mesylate, an oral medication for PCI, can dilate blood vessels, resolve vertebrobasilar circulatory disorders, accelerate craniocerebral blood flow, and reduce vertigo symptoms. However, its effect on improving the quality of life of PCI patients is limited when used as a

monotherapy. According to dialectical analysis of PCI pathological changes in traditional Chinese medicine, this disease is closely related to the interaction of deficiency, stagnation, phlegm, fire, and wind. The main pathogenesis is wind-Yang disturbance, which should be treated with a formula that calms the liver and suppresses Yang [1]. Tianma Gouteng Decoction, composed of various Chinese herbal medicines, can eliminate stasis, promote blood circulation, nourish the liver, enrich Yin, suppress Yang, and calm the liver. Based on this, this article explores the efficacy of Tianma Gouteng Decoction combined with Betahistine Mesylate using 82 PCI patients who visited the hospital from February 2024 to February 2025 as samples.

2. Materials and methods

2.1. Materials

Eighty-two PCI patients who visited the hospital from February 2024 to February 2025 are selected as samples and randomly divided into groups. There was no significant difference in baseline PCI data between Group A and Group B ($P > 0.05$), as shown in **Table 1**.

Table 1. PCI baseline data analysis

Group	*n*	Gender (%)		Age (years)		Disease Duration (months)	
		Male	Female	Range	Mean±SD	Range	Mean±SD
Group A	41	21 (51.22)	20 (48.78)	37–68	53.11 ± 1.88	3–14	6.68 ± 1.08
Group B	41	22 (53.66)	19 (46.34)	37–69	53.16 ± 1.91	3–16	6.62 ± 1.09
X^2/t	-	0.0489		0.1195		0.2504	
P	-	0.8250		0.9052		0.8029	

2.2. Inclusion and exclusion criteria

2.2.1. Inclusion criteria

(1) Meet the PCI standards in the "Chinese Expert Consensus on Posterior Circulation Ischemia" [2]

(2) PCI is indicated by cranial ultrasound and MRI

(3) Signed informed consent

(4) Diagnosed as wind-yang disturbance syndrome according to traditional Chinese medicine

2.2.2. Exclusion criteria

(1) Cognitive impairment

(2) Abnormal liver and kidney function

(3) Allergy to diagnosis and treatment drugs

(4) Dizziness caused by non-PCI factors

2.3. Treatment methods

Group A is treated with Tianma Gouteng Decoction, with the following formula: 30g of Shijueming (*Haliotis* shell); 18g of another type of Shijueming; 15g each of Gouteng, Duzhong, Yejiaoteng, Fushen, Sangjisheng, Yimucao, Huainiuxi; 10g each of Shanzhizi, Huangqin, Tianma. Dialectical prescriptions are as follows: For severe headache, add mulberry leaves, chrysanthemums, and angelica; for severe insomnia and dreaminess, add

keel, oyster, and *Albizia* flowers; for cough and expectoration, add *Pinellia ternata*, windproof, and polygala. The medicinal herbs are decocted in water, and 300ml of juice is taken, which is taken warm in the morning and evening. The medication is administered for 2 weeks.

Group B is orally administered betahistine mesylate [Eisai (China) Pharmaceutical Co., Ltd.; National Medical Approval Number H20040130; 6mg], 6–12mg after meals, 3 times/day. The medication is administered for 2 weeks.

2.4. Observation indicators

(1) Efficacy: If tinnitus and dizziness disappear, the disease does not recur, and arterial blood circulation is restored, it is considered as markedly effective; if tinnitus and dizziness are reduced, and arterial blood circulation speed is accelerated, it is considered as effective; if there is no change in tinnitus, dizziness, and blood circulation speed, it is considered as ineffective.

(2) Syndrome score: Evaluate the patient's condition based on the principles of none, mild, moderate, and severe, including irritability, headache, tinnitus and dizziness, insomnia and dreaminess, etc., with a score of 0–3.

(3) Hemodynamics: Use Doppler ultrasonography to detect PSV indicators, focusing on obtaining blood flow data from the basilar artery and left and right vertebral arteries.

(4) Quality of life: The SF-36 score is directly proportional to the quality of life of PCI patients, divided into four dimensions.

2.5. Statistical research

SPSS 23.0 is used to process data, with % recording and X^2 testing for counting data, ±s recording, and t-testing for measurement data. It has comparative significance, $P < 0.05$.

3. Results

3.1. PCI efficacy

The PCI efficacy of Group A is higher than that of Group B, $P < 0.05$, as shown in **Table 2**.

Table 2. Comparison of efficacy among PCI patients (n,%)

Group	Markedly effective	Effective	Ineffective	Effective rate
Group A (*n*=41)	30 (73.17%)	10 (24.39%)	1 (2.44%)	40 (97.56%)
Group B (*n*=41)	22 (53.66%)	12 (29.27%)	7 (17.07%)	34 (82.93%)
X^2	-	-	-	4.9865
P	-	-	-	0.0255

3.2. PCI syndrome scoring

After medication, the PCI syndrome score in Group A was lower than that in Group B, with $P < 0.05$, as shown in **Table 3**.

Table 3. Comparison of PCI patient syndrome scores ($\bar{x}$ ±s)

Group	Irritability/Restlessness (score)		Head Distension/Headache (score)	
	Before medication	After medication	Before medication	After medication
Group A(*n*=41)	2.49 ± 0.32	0.68 ± 0.18	2.44 ± 0.31	0.72 ± 0.19
Group B(*n*=41)	2.51 ± 0.33	1.33 ± 0.25	2.42 ± 0.32	1.36 ± 0.23
t	0.2786	13.5105	0.2874	13.7365
P	0.7813	0.0000	0.7745	0.0000
Group	**Tinnitus/Dizziness (score)**		**Insomnia/Vivid dreams (score)**	
	Before medication	After medication	Before medication	After medication
Group A(*n*=41)	2.36 ± 0.35	0.69 ± 0.15	2.41 ± 0.36	0.72 ± 0.12
Group B(*n*=41)	2.38 ± 0.37	1.36 ± 0.23	2.43 ± 0.38	1.38 ± 0.21
t	0.2514	15.6236	0.2447	17.4726
P	0.8021	0.0000	0.8074	0.0000

3.3. PCI Hemodynamics

After medication, the PSV of the basilar artery and left and right vertebral arteries in Group A were higher than those in Group B, with $P < 0.05$, as shown in **Table 4.**

Table 4. Comparison of hemodynamic indices in PCI patients ($\bar{x}$ ±s)

Group	Basilar artery PSV(cm/s)		Left vertebral artery PSV(cm/s)		Right vertebral artery PSV(cm/s)	
	Before medication	After medication	Before medication	After medication	Before medication	After medication
Group A(*n*=41)	37.21 ± 2.42	48.11 ± 3.59	32.71 ± 2.33	42.49 ± 3.11	32.28 ± 2.11	42.87 ± 3.25
Group B(*n*=41)	37.23 ± 2.41	42.06 ± 2.73	32.62 ± 2.36	38.82 ± 2.96	32.31 ± 2.13	39.33 ± 3.06
t	0.0375	8.5894	0.1738	5.4733	0.0641	5.0779
P	0.9702	0.0000	0.8625	0.0000	0.9491	0.0000

3.4. PCI quality of life

After medication, the SF-36 score in Group A was higher than that in Group B, with $P < 0.05$, as shown in **Table 5**.

Table 5. Comparison of quality of life in PCI patients ($\bar{x}$ ±s)

Group	Physical health (score)		Mental health (score)	
	Before medication	After medication	Before medication	After medication
Group A(*n*=41)	61.29 ± 2.28	85.51 ± 3.26	62.38 ± 2.36	86.11 ± 3.38
Group B(*n*=41)	61.33 ± 2.26	78.44 ± 3.14	62.39 ± 2.37	75.36 ± 3.09
t	0.0798	10.0016	0.0191	15.0306
P	0.9366	0.0000	0.9848	0.0000

Table 5 (Continued)

Group	Physical role functioning (score)		Social role functioning (score)	
	Before medication	After medication	Before medication	After medication
Group A(*n*=41)	62.44 ± 2.21	86.58 ± 3.45	62.33 ± 2.19	87.16 ± 3.62
Group B(*n*=41)	62.41 ± 2.19	76.11 ± 3.14	62.38 ± 2.23	75.43 ± 3.21
t	0.0617	14.3710	0.1024	15.5240
P	0.9509	0.0000	0.9187	0.0000

4. Discussion

The posterior circulation refers to the vertebrobasilar artery system. If basilar artery sclerosis causes transient cerebral ischemia, it can induce a series of symptoms. After PCI occurs, typical symptoms include sudden balance disorder, where patients suddenly experience a spinning sensation, feeling as if they or their surroundings are rotating. Severe vertigo can be accompanied by nausea and vomiting, and patients may even be unable to walk upright. Visual function may also be impaired, manifesting as blurred vision, visual field defects, double vision, or even temporary blindness. As PCI progresses, patients may develop ataxia, exhibiting clumsy movements, tremor, difficulty performing fine motor tasks, and a few patients may experience swallowing difficulties, hearing loss, limb numbness, headaches, and other symptoms. Clinical diagnosis of PCI is challenging, as it is difficult to accurately classify the type of disease, limiting the effectiveness of management and control measures. Therefore, exploring effective diagnostic and therapeutic drugs is crucial. Western medicine treats PCI with symptomatic drug therapy, commonly using histamine receptor antagonists such as betahistine mesylate. Oral administration can quickly correct intracranial ischemia and hypoxia, alleviating PCI symptoms [3].

However, PCI carries a high risk of recurrence and has a long disease course. Long-term use of betahistine mesylate can lead to drug resistance, affecting its efficacy. Thus, combination therapy with other drugs is necessary. Based on PCI symptoms, traditional Chinese medicine scholars categorize this disease under the “vertigo” umbrella. The disease originates in the brain but is related to kidney, spleen, and liver functions. The liver and kidney transport essence and blood, while the spleen transports and transforms food essence to nourish the brain. If the liver and kidney are deficient, spleen deficiency can lead to phlegm production, liver Yang hyperactivity can cause phlegm-turbidity stagnation, and disturbance of the clear orifices, inducing vertigo. Treatment requires a formula to calm the liver and suppress yang.

Tianma Gouteng Decoction is a classic traditional Chinese medicine formula derived from “New Meanings in the Treatment of Miscellaneous Diseases.” In this formula, Gouteng is combined with Tianma as the monarch drugs, exerting effects of calming wind, suppressing liver, nourishing liver, and tonifying kidneys. Shijueming is combined with Huainiuxi as the minister drugs. Shijueming can suppress liver Yang, brighten eyes, clear heat, and enhance the monarch drugs’ ability to calm wind and suppress liver. Huainiuxi promotes urination, invigorates blood, and guides blood downward [4]. Duzhong is combined with Huainiuxi and Sangjisheng to calm the liver, brighten eyes, and clear heat. Yimucao invigorates blood and calms wind, while Huangqin and Shanzhizi clear and reduce liver fire. Yejiaoteng and Fushen can tranquilize and calm the mind, serving as adjuvant drugs [5]. Based on this foundation, traditional Chinese medicine scholars adjust the formula according to PCI patients’ symptoms, adding drugs to clear the head and eyes for headaches, relieving liver depression and suppressing liver yang for

insomnia and dreams, and adding expectorant and wind-resistant drugs for cough and phlegm [6]. The combination of drugs in Tianma Gouteng Decoction exerts effects of calming wind, stopping convulsions, and suppressing liver yang, which can alleviate symptoms such as vertigo and headaches [7].

Based on the data analysis in this article, the combination of Western medicine and Tianma Gouteng Decoction demonstrates better efficacy in the treatment of PCI (posterior circulation ischemia). The reason for this is that PCI patients take betahistine mesylate orally, which allows the medicinal components to directly reach the vertebrobasilar artery, stimulating arterial dilation and increasing blood supply. This restores arterial blood circulation, corrects intracranial ischemic injury, and subsequently restores blood and oxygen supply to the vestibular system of the inner ear, effectively relieving vertigo symptoms. When combined with Tianma Gouteng Decoction, which exerts effects of calming the nerves, clearing heat, suppressing wind, and stabilizing the liver, it can optimize the efficacy of PCI treatment [8]. Another set of data indicates that the combination of Western medicine and Tianma Gouteng Decoction can reduce PCI symptoms and lower syndrome scores. The reason for this is that oral administration of betahistine mesylate inhibits vestibular lateral protruding neurons and blocks neuronal impulse signal transmission, preventing the onset of vertigo. Based on this, the combination therapy with Tianma Gouteng Decoction exerts antiplatelet aggregation, improves blood viscosity, and lowers blood lipid levels, thereby reducing vertebrobasilar artery damage and restoring arterial blood circulation, resulting in a decrease in various symptom scores [9].

Another set of data suggests that the combination of Western medicine and Tianma Gouteng Decoction can improve patients' basilar artery and left and right vertebral artery PSV indicators, as well as increase SF-36 scores. The reasons for this include the presence of various medicinal components in the combined therapy. For example, abalone shell can regulate blood pressure, relieve eye discomfort, and reduce the severity of vertigo; *Gastrodia elata*, rich in gastrodin, acts on the nervous system to accelerate vertebrobasilar artery blood circulation, optimize intracranial microcirculation, and enhance PCI auxiliary control effects; motherwort components can prevent thrombosis and platelet aggregation, protecting coronary artery and heart function, and facilitating the removal of arterial blood flow obstacles; baicalin can reduce craniocerebral reperfusion injury, optimize craniocerebral function, protect intracranial microvascular structure, and repair damaged craniocerebral tissue, facilitating the restoration of craniocerebral microcirculation; mulberry mistletoe can accelerate craniocerebral microcirculation and stabilize blood pressure; *Poria cocos* can reduce anxiety and stabilize the mind, correcting symptoms such as excessive dreaming and palpitations; various active components in tuber fleeceflower root can regulate the central nervous system, extending deep sleep time and shortening sleep latency, thereby avoiding vertigo recurrence due to insufficient sleep time; *Eucommia* bark and cape jasmine fruit can stabilize blood pressure and promote body microcirculation, helping to relieve vertigo symptoms; and *Uncaria rhynchophylla* can inhibit craniocerebral vascular sclerosis and maintain stable blood pressure, thereby reducing vertigo symptoms [10, 11].

However, during the treatment of PCI patients with Tianma Gouteng Decoction and other medications, it is recommended to increase intake of high-fiber foods such as grains, fruits, and vegetables, avoid smoking and alcohol consumption to reduce vascular damage caused by improper food intake. Patients should also be guided to regulate their emotions, autonomously adjust feelings of anger, tension, and anxiety, and adopt stress-relieving methods such as chatting, traveling, and listening to soft music to stabilize their emotions. Additionally, increasing nighttime sleep duration to 7–8 hours can help improve vertigo symptoms. In summary, the combination of betahistine mesylate and Tianma Gouteng Decoction in the treatment of PCI patients can improve vertebrobasilar microcirculation, reduce PCI symptoms, and optimize the quality of life for PCI patients, demonstrating

promotional value.

5. Conclusion

The combination of Tianma Gouteng Decoction and Betahistine Mesylate demonstrates notable efficacy and feasibility in treating PCI (Posterior Circulation Ischemia). This therapeutic approach not only improves hemodynamic indicators but also significantly reduces disease severity scores, suggesting its potential as a promising treatment strategy for PCI management. Further clinical studies are warranted to validate these findings and explore long-term outcomes.

Disclosure statement

The authors declare no conflict of interest.

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