

Research Progress on Tianma Gouteng Decoction in the Treatment of Vertigo Due to Hyperactivity of Liver Yang

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Abstract: Vertigo is a traditional Chinese medicine symptom. "Xuan" refers to blurred vision or blackness before the eyes, and "yun" refers to dizziness or even a feeling of rotation of oneself or the external scenery. They often occur simultaneously, so they are collectively called "vertigo". Hyperactivity of liver yang is the most common symptom in clinical practice. Tianma Gouteng Decoction is from the book "New Therapeutics of Miscellaneous Syndromes in Internal Medicine of Traditional Chinese Medicine". It belongs to the category of wind-treating prescriptions and has the effects of calming the liver and suppressing wind, clearing heat and activating blood circulation, and tonifying the liver and kidney. It is mostly used for vertigo due to excessive liver yang and upward disturbance of liver wind. This article aims to analyze the meaning of Tianma Gouteng Decoction and review the clinical efficacy of Tianma Gouteng Decoction in the treatment of vertigo due to hyperactivity of liver yang.

1. Introduction

Vertigo is a traditional Chinese medicine symptom. "Xuan" refers to blurred vision or blackness before the eyes, and "yun" refers to dizziness or even a feeling of rotation of oneself or the external scenery. They often occur simultaneously, so they are collectively called "vertigo". Physicians in past dynasties believed that the pathogenesis of vertigo is based on deficiency and excess. Deficiency is manifested as insufficiency of qi, blood, and kidney essence. Excess is manifested as wind, fire, phlegm, and stasis disturbing the clear orifices. For example, in "Spiritual Pivot · Defense Qi", it is said that "deficiency on the upper part leads to vertigo." "Spiritual Pivot · Sea Discourse" says: "Insufficiency of the sea of marrow leads to dizziness with tinnitus and weakness and soreness of the shins" [1]. "Danxi's Mastery of Medicine · Dizziness" holds that "vertigo does not occur without phlegm." In traditional Chinese medicine treatment of vertigo, it is necessary to first conduct syndrome differentiation and typing, and then take targeted treatment according to the disease type. According to different clinical syndromes, traditional Chinese medicine can have multiple types, such as phlegm-dampness obstructing the middle type, hyperactivity of liver yang type, deficiency of qi and blood type, insufficiency of kidney essence type, etc., and the hyperactivity of liver yang type is more common in clinical practice [2]. It is manifested as dizziness and tinnitus, headache and

distending pain in the head and eyes, insomnia and many dreams, bitter taste, etc. The pathogenesis is liver yang wind-fire disturbing the clear orifices [3]. Tianma Gouteng Decoction has the effect of calming the liver and suppressing yang. Its curative effect in treating vertigo of hyperactivity of liver yang type has been widely recognized clinically. Now, based on the analysis of the meaning of Tianma Gouteng Decoction and the etiology and pathogenesis of vertigo of hyperactivity of liver yang type, and combined with modern clinical research on the clinical research status of Tianma Gouteng Decoction in treating vertigo of hyperactivity of liver yang type and its accompanying symptoms and combined diseases, a review is conducted in order to provide a basis for the clinical promotion of Tianma Gouteng Decoction in treating vertigo [4].

2. Understanding of vertigo in Western medicine

Vertigo is one of the most common symptoms in patients visiting the neurology department [5]. The results of many studies suggest that the proportion of female patients is higher than that of male patients, and as age increases, the prevalence of vertigo gradually increases. Diseases causing vertigo involve otolaryngology, neurology, psychiatry, orthopedics, ophthalmology and general internal medicine, etc., and the etiology is complex. Some studies [6] have shown that in adolescents, systemic and peripheral causes are more common. In young adults and middle-aged people, psychiatric and peripheral lesions are more common. In the elderly, central and systemic causes are the main etiologies. To sum up, the etiology of vertigo is complex and the diagnostic process is relatively cumbersome. At present, the main problems existing in the diagnosis and treatment of vertigo by some neurologists in China are insufficient theoretical knowledge and being stuck in traditional diagnostic thinking and treatment methods [7].

3. Etiology and pathogenesis of vertigo due to hyperactivity of liver yang in traditional Chinese medicine

According to "The Inner Canon", it is recorded that "all wind-induced tremors and dizziness belong to the liver", which first proposed that dizziness is closely related to the liver. It can be known that when liver wind attacks upward, it will definitely cause dizziness [8]. Professor Tang Yunhua believes that dizziness is related to the liver, and the etiology and pathogenesis reflected in different groups are also different. The dizziness suffered by middle-aged women is mostly related to liver depression transforming into fire and phlegm-heat disturbing upward. Elderly patients with dizziness are closely related to hyperactivity of liver yang and upward disturbance of wind-yang. For those with congenital or acquired deficiency of yang qi, it is mostly caused by deficiency of liver yang and lack of warmth-nourishing of the brain [9]. Professor Chen Meihua also believes that dizziness is most closely related to liver diseases. The dizziness caused by "liver" is mainly due to insufficiency of liver yin and hyperactivity of liver yang, or emotional disorders and qi stagnation, or liver qi stagnation and transformation into fire due to depression on three aspects [10]. Professor Zhang Mingbo believes that dizziness in young people is mainly related to hyperactivity of liver yang and flaming of liver fire. It is mostly caused by the fact that young people are full of qi and fire, coupled with excessive pressure and improper emotions in normal times [11]. In conclusion, dizziness is attributed to the liver. Because the liver is an organ of wind and wood, with yin in substance and yang in function. The liver governs ascent and activity. Hyperactivity of liver yang or deficiency of liver and kidney yin, where yin cannot restrain yang, leads to excessive yang rising upward, disturbing the clear orifices, and causing dizziness. Or due to liver qi stagnation, wood depression restraining earth, and then accompanied by phlegm transforming into fire and disturbing the clear orifices, it also causes dizziness [8].

The main physiological function of the liver is to ensure the smooth flow of qi. The physiological

characteristics are mainly upward promotion, preferring smoothness and detesting depression. If the liver fails to ensure the smooth flow of qi, the ascending, descending, exiting, and entering of qi in the whole body will be out of balance, which can cause excessive ascent of qi (i.e., qi counterflow) or unsmooth qi movement (i.e., qi stagnation). If liver qi ascends excessively and qi movement is in disorder, it is easy to trigger internal wind. When it rushes upward to the brain orifices, vertigo occurs. When liver qi is in disorder, it often transversely attacks the stomach. When wood is exuberant and restrains earth, the spleen earth is violated by liver wood. The spleen's transportation and transformation of essence of water and grains, absorption, and distribution are out of balance. Clear yang cannot ascend and turbid yin cannot descend. The brain is deprived of nourishment and vertigo occurs. When liver qi is not smooth and qi stagnation turns into depression, the blood flow is blocked. Blood stagnates in the vessels and forms blood stasis. If blood stasis resides in the brain orifices, vertigo due to blood stasis occurs. Excessive qi turns into fire. If liver qi stagnation lasts for a long time, it can generate fire pathogen. Then it triggers liver wind. When combined with phlegm and attacking the clear orifices upward, vertigo occurs. If the fire pathogen is extremely exuberant for a long time and is not treated, it will burn yin fluid and cause yin deficiency. When yin deficiency and yang hyperactivity occur, liver yang is hyperactive. When internal wind is triggered and yin deficiency causes wind movement, vertigo occurs. The liver and kidney are of the same origin and mutually nourish each other. If kidney yin is deficient or kidney essence has declined due to old age, and kidney yin essence cannot restrain liver yin, then insufficient liver yin cannot nourish liver yang. This can lead to yang hyperactivity transforming into wind and rushing upward to the brain orifices, causing vertigo [12].

The treatment principle for excessive ascent should be to suppress it. As stated in "Case Records as a Guide to Clinical Practice", "For excessive liver yang, shellfish-like substances must be used to subdue it, gentle and quiet substances to restrain it. The taste should be sour and astringent, or assisted by salty and descending substances. It is necessary to clear the heat in the collaterals and vessels. Then the ascending yang will subside." Therefore, for vertigo due to hyperactivity of liver yang, the treatment mostly takes calming the liver and suppressing yang as the main principle, and the formula is modified Tianma Gouteng Decoction [12].

4. Analysis of the meaning of Tianma Gouteng Decoction

Tianma Gouteng Decoction is from "New Therapeutics of Miscellaneous Syndromes". It has the effects of calming the liver and suppressing yang, clearing heat and extinguishing wind, and tonifying the liver and kidney. Modern analysis has found that the combination of Tianma Gouteng Decoction and western medicine in the treatment of hypertension is superior to the use of western medicine alone in many aspects such as efficacy and safety, providing a new reference basis for the treatment of hypertension with traditional Chinese medicine [13, 14].

In the formula, *Gastrodia elata* calms the liver, extinguishes wind and stops convulsions. Supplemented by *Uncaria rhynchophylla* which clears liver heat and extinguishes liver wind. Both enter the liver meridian. When used together, they can strengthen the effect of calming the liver and extinguishing wind. *Concha Haliotidis* is heavy in nature and can suppress and submerge, calming the liver and suppressing yang. Assisted by *Scutellaria baicalensis* and *Gardenia jasminoides* to clear heat and drain fire, so that liver heat will not be overly excessive. *Cyathula officinalis* and *Leonurus japonicus* can activate blood and regulate menstruation. *Cyathula officinalis* can also lead blood downward and directly subdue excessive yang. Both drugs have a downward property, which is conducive to the reduction of liver yang. *Eucommia ulmoides* and *Taxillus chinensis* tonify the liver and kidney. *Polygoni multiflori Caulis* and *Poria cum Ligno Hoveniae* soothe the mind and calm the nerves. When all the drugs are used together, they have the effects of calming the liver and

extinguishing wind, clearing heat and calming the mind, tonifying the liver and kidney, and leading blood downward. In clinical application, for those with severe dizziness and headache, it is mostly due to excessive hyperactivity of liver yang disturbing the mind. In traditional Chinese medicine, it is believed that for all excessive liver yang, heavy substances should be added. Therefore, calcined Oyster Shell and calcined Dragon Bone are added to calm the mind and suppress excessive yang, and drain fire with bitter-cold properties. If there is severe bitter taste and red eyes, *Prunella vulgaris* and *Chrysanthemum morifolium* are added to clear heat from the liver meridian. If there is soreness and weakness of the waist and knees, *Lycium barbarum* and *Rehmannia glutinosa* are added to tonify the liver and kidney [14,15].

5. Clinical application of Tianma Gouteng Decoction

Hou Qian [16] collected 80 patients with hyperactivity of liver yang type and divided them into two groups of 40 cases each by coin tossing. The control group was treated with intravenous injection of betahistine injection, 20 mg/(time day). The observation group was additionally treated with Tianma Gouteng Decoction. The total effective rate of treatment in the observation group was 97.50%, which was higher than 77.50% in the control group. The incidence of adverse reactions in the observation group was 7.50%, which was lower than 25.00% in the control group. For patients with vertigo due to hyperactivity of liver yang, the treatment of Tianma Gouteng Decoction + betahistine injection has a better effect and can effectively improve their clinical symptoms. The clinical application is relatively safe.

Liu Yuanyuan [17] collected 150 patients with hypertension of hyperactivity of liver yang type. According to the lottery method, they were divided into an observation group and a control group, with 75 cases in each group. The control group was given 2.5 mg of levamlodipine besylate tablets orally once a day for 6 months of continuous treatment. The observation group was given modified Tianma Gouteng Decoction on the basis of the control group. The total effective rate of the observation group was higher than that of the control group (97.33% vs 88.00%, $\chi^2 = 4.807$, $P = 0.028$). After 6 months of treatment, the levels of serum high-sensitivity C-reactive protein, tumor necrosis factor, homocysteine, and cystatin C in the two groups decreased. The serum folic acid level in the observation group increased, and the level in the observation group was lower/higher than that in the control group ($P < 0.01$). In conclusion, the implementation of modified Tianma Gouteng Decoction combined with levamlodipine in the treatment of hypertension of hyperactivity of liver yang type can significantly control the blood pressure of patients, reduce the vascular micro-inflammatory state and the risk of cardiovascular diseases, reduce the adverse effects caused by the disease on patients, and has high safety and important application value.

Shen Wenhong [2] collected 98 cases as the research subjects, all of whom had vertigo (of hyperactivity of liver yang type). The grouping method was the random number table method, including a control group and an observation group, with 49 cases in each group. The control group was treated with western medicine. The drug selected was Betahistine Mesylate Tablets from Eisai (China) Pharmaceutical Co., Ltd. (with a specification of 6mg×100 tablets and a national drug approval number of H20040130). Oral treatment was administered, three times a day, two tablets each time, for a total of 2 weeks of treatment. The observation group was treated with western medicine combined with traditional Chinese medicine. The western medicine regimen was the same as that of the control group, and the traditional Chinese medicine was modified Tianma Gouteng Decoction, a self-designed prescription. The total effective rate of the observation group was higher than that of the control group. There was no significant difference in the traditional Chinese medicine syndrome score and the Dizziness Handicap Inventory (DHI) score between the two groups before treatment. After treatment, the traditional Chinese medicine syndrome score and DHI score of the

observation group were lower, which was different from that of the control group. There was no difference in safety between the two groups. For vertigo (of hyperactivity of liver yang type), combined treatment with modified Tianma Gouteng Decoction on the basis of conventional western medicine treatment can further improve the symptoms of patients and reduce the degree of vertigo disability, thereby better improving the clinical efficacy without significantly increasing side effects, and it has application value.

Wen Jiawei [18] collected 60 cases of essential hypertension of hyperactivity of liver yang type. The main symptoms are dizziness and headache. The secondary symptoms are facial flushing, irritability, tinnitus, and insomnia. Tongue and pulse: red tongue, yellow coating, and taut and forceful or taut and thready rapid pulse. The research subjects were randomly divided into a control group and an observation group in a 1:1 ratio according to the random number table method, with 30 cases in each group. The control group was given valsartan (produced by Zhejiang Huahai Pharmaceutical Co., Ltd., batch number: 0000048477), once a day, 80 mg each time, orally after breakfast. The observation group was given acupuncture combined with modified Tianma Gouteng Decoction on the basis of the control group. Compared with before treatment in this group, the morning SBP and DBP of the two groups of patients were significantly reduced after treatment, and the observation group was better than the control group. After treatment, the scores and total scores of dizziness, headache, irritability, and tinnitus of the control group were significantly lower than before treatment. The research results show that acupuncture at the "four passes" acupoints combined with oral administration of Tianma Gouteng Decoction in the treatment of essential hypertension of hyperactivity of liver yang type has a significant curative effect and can significantly improve hypertension and accompanying symptoms.

6. Summary

The etiology of vertigo is complex. Common causes include Meniere's syndrome, hypertension, and vertebrobasilar insufficiency. At present, in Western medicine treatment, it mainly suppresses the occurrence of related symptoms, but it is prone to recurrence and has many adverse reactions [3]. Modern pharmacological research and the observation of the efficacy of various clinical trials have proved that Tianma Gouteng Decoction is a classic prescription for the clinical treatment of vertigo, insomnia, headache, tinnitus, hypertension, and cerebral hemorrhage due to excessive liver yang. This prescription can effectively improve the blood pressure level of patients with hypertension (such as hyperactivity of liver yang type and yin deficiency and yang hyperactivity type), and also has a significant protective effect on target organs such as the heart, brain, and kidneys [19, 20,21]. However, the active ingredients and mechanism of action of this prescription need to be further clarified to make this classic prescription of Tianma Gouteng Decoction have a wider application in clinical practice.

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