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Clinical Study on the Near-and Long-Term Efficacy of Warm Acupuncture Combined with Cervical Core Muscle Training on Cervical Vertigo of Qi and Blood Deficiency Type

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Abstract: This study aimed to explore the effect of warm acupuncture combined with cervical core training on the near- and long-term efficacy of cervical vertigo of qi and blood deficiency type. Ninety patients were randomly divided into three groups: warm acupuncture group, cervical core group, and combined treatment group, with 30 cases each. The warm acupuncture group received only warm acupuncture, the cervical core group underwent cervical core muscle training, and the combined group received both treatments. Outcomes were measured using the Vertigo Symptom and Function Assessment Scale (ESCV), bilateral vertebral artery blood flow velocities, and treatment efficiency. Results showed that the combined treatment group had significantly better ESCV scores, improved vertebral artery blood flow velocity, and higher efficacy rates (86.67%) compared to the other groups. The study concluded that warm acupuncture combined with cervical core training effectively improves clinical symptoms and vertebral artery blood flow in patients with qi and blood deficiency type cervical vertigo.

1. Introduction

Cervical vertigo is a common clinical vertigo disease[1], in traditional Chinese medicine, cervical vertigo is mainly due to the patient's meridian obstruction, making his/her qi and blood not smooth, causing the vertebral arteries to have insufficient blood supply, which produces episodes of vertigo, headache, neck and shoulder pain, etc[2-3], and in severe cases, sudden collapse can occur. Among the TCM diagnostic subtypes of cervical vertigo, the qi and blood deficiency type is the most common type[4-5]. There are fewer clinical reports on the combination of Chinese and Western medicine for the treatment of cervical vertigo [6]. The aim of this study was to explore the therapeutic effect of warm acupuncture and moxibustion combined with cervical core training on patients with cervical vertigo with qi and blood deficiency.

2. Materials and Methods

2.1. Study Subjects

From January 2022 to April 2023, 90 patients were admitted to the Rehabilitation Department of the First Affiliated Hospital of Nanchang University who met the criteria for “dizziness” due to qi and blood deficiency according to the “Guidelines for Clinical Research on New Traditional Chinese Medicines”[7] and the Western medical diagnostic criteria for cervical dizziness as outlined in the “Multidisciplinary Expert Consensus on the Diagnosis and Treatment of Dizziness”[8]. Patients were excluded if their cervical vertigo was caused by factors other than qi and blood deficiency, if they had no severe concomitant diseases involving major organs, blood, cardiovascular, immune, or endocrine systems, or if they were pregnant or breastfeeding women. They were randomly assigned to three groups: warm acupuncture (WA) group, cervical core(CC) group, and combined therapy(CT) group, with 30 cases in each group.

2.2. Research Methods

2.2.1. Warm Acupuncture Group: Patients were placed in a prone position

After routine disinfection with 75% medical alcohol, 0.3mm × 40mm acupuncture needles (Suzhou Acupuncture Supplies Co., Ltd.) were used to perform acupuncture techniques for balanced tonification and dispersion. The primary acupoints included bilateral cervical paravertebral points at C3-5, Fengchi, Fengfu, Tianchu, and Dazhui. The auxiliary acupoints included Juegu, Hegu, and Houxi. Patients were instructed to lie prone on the treatment bed. The practitioner stands behind the patient, disinfects the acupoints, and uses a 1.0-inch acupuncture needle to perform oblique insertion at a depth of 0.5–0.8 inches along the cervical paravertebral points toward the spine. A 1.5-inch acupuncture needle is used for direct insertion at a depth of 0.5–0.8 inches at the Dazhui point. The remaining acupoints are treated using conventional acupuncture techniques. Using moxa cones purchased by our hospital, they are inserted into the needle handles and ignited. Then, conduct moxibustion therapy on the selected acupoints for 15 minutes. Replace the moxa cones and repeat the moxibustion session. The total treatment duration for each session is 30 minutes, administered once daily for 14 consecutive days.

2.2.2. Cervical core Group

(1) Cervical Spine Weak Link Test: The patient lies supine on a multi-position manual therapy bed, with the occipito-mandibular ligament fixed to support the head and a chest strap fixed to stabilize the trunk. Elevate the patient's lower limbs to the most comfortable position. Lower the upper section of the treatment bed to ensure the patient's head is fully supported by the cervical collar. Adjust the cervical collar height to the optimal comfort level while maintaining the cervical spine in a neutral position. Record the duration the patient can sustain this posture until neck fatigue occurs or a break is requested. If the cervical spine function is normal and there is no neck pain, the patient should be able to maintain the neutral position for at least 120 seconds. Fatigue and/or the need for rest before 120 seconds is an indicator of impaired function of the deep cervical stabilizing system, suggesting the need for treatment. Open-chain exercises assess the function of the cervical flexor, extensor, lateral flexor, and rotator muscle groups to identify weaknesses. Positive signs include inability to perform the movement correctly, pain, or asymmetry between sides.

(2) Training includes the following components: muscle relaxation training, joint range of motion training, joint stability training, sensory-motor coordination training, and isometric resistance training. The training steps are performed sequentially as shown in Figure 1, with each set consisting of

correctly completing the movement and maintaining it for 2 minutes without inducing pain. Conduct 2 to 3 training exercises daily, with each exercise completed in 3 to 5 sets. Progress to the next movement the following day, maintaining a 10-second contraction duration, with a 30-second rest interval between sets, and performing 5 repetitions in each direction.

The combined treatment group undergoes acupuncture combined with cervical core muscle training.

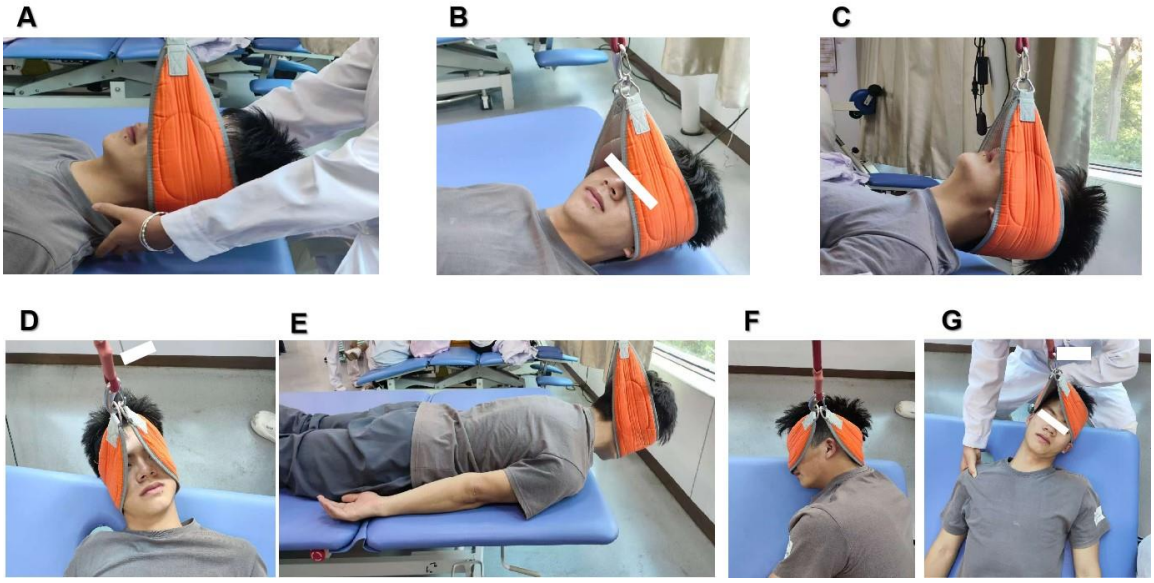

Figure 1 Steps of training.

2.3. Evaluation Methods

2.3.1. Cervical Vertigo Symptom and Function Assessment Scale (ESCV) [9]

The Cervical Vertigo Symptom and Function Assessment Scale developed by Wang Chuhai et al. was used to score all patients before treatment, 14 days after treatment, and six months after treatment. This includes vertigo (including severity, frequency, and duration) (0–16 points), neck and shoulder pain (0–4 points), headache (0–2 points), daily activities and work (0–4 points), psychological and social adaptation ability (0–4 points), with a total score of 30 points. A higher score indicates milder clinical symptoms.

2.3.2. Vertebral Artery Mean Blood Flow Velocity Vm (Bilateral) Measurement

All patients underwent vertebral artery blood flow velocity measurements using a color transcranial Doppler ultrasound device before treatment and 14 days after treatment[10].

2.3.3. Clinical efficacy assessment

It refers to the efficacy criteria specified in the Diagnostic and Efficacy Standards for TCM Disease s[11]. Cure: Vertigo and neck and head symptoms have disappeared, neck movement is normal, and the patient can perform daily work and activities. Marked improvement: Vertigo and cervical symptoms have largely resolved, cervical mobility remains normal, but pain occurs during prolonged desk work, which subsides after brief rest, with daily work and life largely restored to normal. Improvement: Vertigo and cervical symptoms have improved, but pain worsens during prolonged desk work, which subsides after brief rest, with some restriction in cervical mobility, and daily work and life can be maintained to a certain extent. Ineffective: Vertigo and head/neck symptoms show no

improvement compared to previous conditions, physical signs show no significant relief, daily life is affected, and the patient is unable to perform daily work. Efficacy rate = (Effective + Significant improvement + Cured) cases / Total cases × 100%

2.4. Statistical Methods

Data were analyzed using SPSS 23.0:

- Measurement data were expressed as mean ± standard deviation, and compared between groups using independent sample t-test.
- Enumeration data were expressed as percentage (%), and compared between groups using test.
- Statistical significance was set at α=0.05 (two-tailed test).

3. Results

3.1. Comparison of ESCV score

There was no significant difference in the ESCV scores of all patients before treatment (*P>0.05*). The ESCV scores were higher than those before treatment after 14 days and six months of treatment, and the differences between and the pre-treatment were statistically significant (*P<0.05*); The ESCV scores of the combined treatment group were better than those of the warm acupuncture group and the cervical core group after 14 days and six months of treatment (*P<0.05*, Table 1).

Table 1 Comparison of patients' ESCV scores before and after treatment

Group	Before treatment	After 14 days of treatment	After half a year of treatment
WA group(n=30)	16.81 ±0.45	22.85 ± 0.54[a]	19.12 ± 0.23[a]
CC group(n=30)	16.32 ± 0.38	23.48 ± 0.52[a]	20.11 ± 0.31[a]
CT group(n=30)	16.85 ± 0.41	26.13 ± 0.48[ab]	21.53 ± 0.27[ab]

Note: the same group vs. before treatment, [a]$P < 0.05$; CT group vs. the other groups at the same time, [b]$P < 0.05$.

3.2. Comparison of mean vertebral artery blood flow velocity

Comparison of the mean blood flow velocity of the vertebral artery bilaterally in all patients before treatment, the difference was not statistically significant *(P* > 0.05); After 14 days of treatment, the mean blood flow velocity of the vertebral artery bilaterally in all patients was accelerated, and the combined treatment group was better than the warm acupuncture group and the cervical core group, and the difference was statistically significant (*P<0.05*, Table 2).

Table 2 Comparison of mean blood flow velocity of bilateral vertebral artery before and after treatment of patients

Group	Left vertebral artery		Right vertebral artery	
	Before treatment	After 14 days of treatment	Before treatment	After 14 days of treatment
WA group(n=30)	20.43 ±3.41	30.13 ±2.27c	20.23 ±2.15	30.47 ±2.57[c]
CC group(n=30)	20.23 ± 4.22	31.55 ± 1.23c	20.52 ± 3.65	32.67 ± 1.42[c]
CT group(n=30)	21.57 ± 3.12	33.32 ± 5.54(c) (d)	21.12 ± 2.85	33.45 ± 7.31 [cd]

Note: the same group vs. before treatment, [c]$P < 0.05$; CT group vs. the other groups at the same time, [d]$P < 0.05$.

3.3. Comparison of clinical efficacy

After 14 days of treatment, the effective rate of 86.67% in the combined treatment group was higher than that of 83.33% in the warm acupuncture group and 76.67% in the cervical core group, and the difference was statistically significant ($P<0.05$, Table 3).

Table 3 Comparison of patients' treatment effect [case (%)

Effect	WA group(n=30)	CC group(n=30)	CT group(n=30)
Ineffective	16.7%(5)	23.3%(7)	13.3%(4)
obvious effect	66.7%(20)	56.7%(17)	60%(18)
Cured	16.6%(5)	20%(6)	26.7%(8)
Effective rate (%)	83.33%	76.67%	86.67%^{e}

Note: CTgroup vs. the other groups, respectively, $^{e}P < 0.05$.

4. Discussion

4.1. The incidence of cervical vertigo ranks first in vertigo diseases

In recent years, cervical vertigo ranks has the characteristics of easy recurrence and low age trend [12], which is one of the important diseases affecting the quality of life of modern people. There are many hypotheses about the etiology of cervical vertigo in China, but its pathogenesis has not been clarified [13-14]. Traditional Chinese medicine believes that cervical vertigo belongs to the category of "paralysis" and "vertigo", which is caused by various reasons, such as deficiency of qi and blood, deficiency of the root cause, paralysis of the meridians and collaterals, and poor operation of qi and blood, and it is treated with traditional Chinese medicine and acupuncture[15-16]. Modern medicine believes that cervical vertigo is caused by insufficient blood supply to the vertebral arteries due to cervical degeneration, which is mainly treated with traction and manipulation, supplemented by physical factors, medication, exercise and other related means[17-18]. Both Chinese and Western medicine can achieve significant therapeutic effects, but each has its own shortcomings[19-21]. This group proposes a combination of Chinese and Western medicine in order to find a more effective and safe treatment option.

4.2. Warm acupuncture is a common diagnostic and therapeutic tool in traditional Chinese medicine

Some scholars have reported that the frequency of using specific points was analysed by selecting acupuncture points for the treatment of cervicogenic vertigo, and it was found that rendezvous points had the highest frequency of use, followed by the five transport points[22], of which the cervical pinch point is the main point, which has the effect of relieving the cervical musculature and regulating the cervical nerve conduction[23] ; and the acupuncture point of Fengchi has the effect of improving the circulation of the brain and lowering the viscosity of the blood[24].Baihui point is the primary point, and the acupuncture point of Baikai is the most common point of treatment in traditional Chinese medicine.) (]); Hundred Happiness point can promote the circulation of qi and blood, benefit qi and raise yang; acupuncture Qihai point and Blood Sea point can tonify qi and move qi; acupuncture Spleen Yu and Stomach Yu points can harmonise the stomach and strengthen the spleen, and subdue rebelliousness and promote diuresis. The above acupoints work together to relieve meridians and activate collaterals, benefit qi and warm the middle, and together with the warm stimulation of moxibustion to achieve the effect of clearing collaterals and removing paralysis, promoting qi and activating blood circulation[25] ; at the same time, acupoint stimulation plays a role

in regulating the balance of sympathetic nerves and parasympathetic nerves[26] to improve the body's autonomic function, thus reducing the frequency and degree of cervical vertigo attacks.

4.3. The role of the cervical core muscles

The cervical core muscles play an important role in the postural and balance control of the human trunk[27]. And an imbalance of the cervical core muscles can cause alterations in vertebral artery haemodynamics to varying degrees[28], thus exacerbating symptoms in patients with cervical vertigo[29]. Some scholars have reported that core muscle training can improve balance control and clinical symptoms in patients with cervical vertigo[30-31]. Based on the principle of "in the tendon, keep the tendon" of the meridian theory, the use of cervical core muscle training to strengthen the neck muscles not only helps to restore the normal anatomical position of the cervical spine, but also improves the stability of the cervical spine and the balance of the human body[32-33]. It can also release the local stuck pressure to achieve the therapeutic purpose of unblocking qi and blood and relieving pain.

4.4. Advantages of combined treatment regimens

The results of this study showed that after 2 weeks of treatment, the effective rate of the combined treatment group was significantly higher than that of the control group ($P < 0.05$); the ESCV scores of the patients in the combined group were all significantly better than that of the control group ($P < 0.05$), and the average blood flow velocity of the bilateral vertebral arteries was higher than that of the control group in the combined group after treatment. This indicates that in warm acupuncture has a certain therapeutic effect on patients with cervical vertigo of qi and blood deficiency type, and the efficacy is more significant after combined cervical core muscle training. We believe that the possible mechanisms by which combined treatment improves vertebral artery blood flow velocity over monotherapy include: warm acupuncture can play a role in relieving neck tension and pain, increasing vertebral artery blood flow velocity and regulating neural function[34-35], and cervical core muscle training on top of which not only reduces mechanical compression of the vertebral arteries and strengthens the balance of cervical biomechanics, but also promotes cervical proprioceptive input[36-37], further improving the clinical symptoms of cervical vertigo;

4.5. Long-term efficacy

The ESCV scores after six months were significantly better in the combined treatment group than those in the monotherapy group, and poor adherence to home training was identified as a major factor affecting the therapeutic outcomes. The combined treatment plan can improve the near-term therapeutic effect as well as help to improve the patients' scores after half a year, which is a simple, inexpensive, safe and practical therapeutic plan, and it is worthwhile to promote the use of clinical application because the two treatments promote each other and work synergistically, so it is more effective than the single treatment.

4.6. Limitations and Future Directions

This study has certain limitations due to factors such as the small sample size. Further research is needed to expand the sample size and conduct longer-term follow-up.

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