ORIGINAL RESEARCH

Clinical effect of cervical health exercises combined with traditional Chinese medicine wax therapy in the treatment of vertebral artery type cervical spondylosis

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Abstract

Background

This research aimed to elucidate clinical effect of cervical health exercises combined with traditional Chinese medicine wax therapy in treating vertebral artery type cervical spondylosis.

Methods

Eighty patients treated in Second Affiliated Hospital of Anhui University of Chinese Medicine from October 2022 to October 2023 were divided into observation group and control group on average. There are 40 cases in each group. The control group received acupuncture and moxibustion treatment and conventional symptomatic treatment. On the basis of conventional treatment in control group, observation group received cervical health exercises and traditional Chinese medicine wax therapy treatment.

Results

The total effective rate in observation group exhibited elevation relative to that in control group. Clinical Assessment Scale for Cervical Spondylosis scores and total scores in both groups exhibited elevation relative to those before treatment, and observation group exhibited elevation relative to control group. The hospitalization time in observation group exhibited depletion relative to that in control group.

Conclusion

Cervical health exercises combined with traditional Chinese medicine wax therapy can effectively elevate cure rate, shorten hospitalization time, and improve quality of life of patients with vertebral artery type cervical spondylosis, which may be worth further promoting.

Keywords: vertebral artery type cervical spondylosis, cervical health exercises, traditional Chinese medicine wax therapy,

Introduction

Cervical spondylosis often results from degenerative diseases such as cervical hyperostosis, intervertebral disc herniation, and thickening of cervical ligaments, which compress adjacent tissues such as the cervical nerve and nerve roots[1-3]. Cervical spondylosis exerts characteristics of gradual development and recurrent attacks; mild cases can hinder function, while severe cases can lead to bedridden and unable to take care of themselves, often causing negative emotions and attenuating the quality of life for patients [4, 5]. Vertebral artery type cervical spondylosis is quite common in clinical practice, majorly due to various mechanical and dynamic elements that cause compression and stimulation of vertebral artery, resulting in vascular tortuosity and stenosis, and affecting insufficient blood supply to vertebral basilar artery[6,7]. After onset of such disease, clinical manifestations of patients majorly include recurrent dizziness, giddiness, nausea and vomiting, and neck pain[8].

Currently, there is no specific clinical treatment for such disease. The surgical methods are complex, highly traumatic, and have a high risk of postoperative complications; nevertheless, application of Western medicine alone can only temporarily control symptoms 9. In the past two years, advances in cervical spondylosis management have emphasized multimodal, minimally invasive, and personalized approaches, including image-guided interventions, robotic-assisted precision therapies, and combined physical rehabilitation programs that focus on neuromuscular re-education and cervical stabilization[10,11]. Recent rehabilitation strategies, such as proprioceptive training, deep cervical flexor strengthening, and therapeutic exercises guided by wearable sensors, have shown potential to improve cervical spine mobility and vascular function[12-14]. Moreover, integrative therapies based on traditional Chinese medicine-such as acupuncture, tuina, and moxibustion—have been increasingly recognized for their role in relieving pain and restoring vascular dynamics[15]. Traditional Chinese medicine wax therapy represents an emerging adjunctive treatment that combines thermotherapy with the pharmacological effects of Chinese herbal ingredients. Recent studies have suggested that wax therapy can enhance local circulation, modulate inflammation, and improve neuromuscular coordination when combined with rehabilitative exercise[16,17]. Research has demonstrated that effective functional exercises based on wax therapy can facilitate recovery of cervical vertebra function of vertebral artery type cervical spondylosis patients[15].

Previous research has primarily investigated traditional

Chinese medicine wax therapy or cervical rehabilitation exercises as isolated treatments for cervical spondylosis, focusing mainly on pain relief, inflammation reduction, or muscle strengthening. However, few studies have explored the synergistic effects of combining these two complementary modalities, especially for vertebral artery type cervical spondylosis, which involves both vascular and neuromuscular dysfunction. The novelty of the present study lies in integrating traditional Chinese medicine wax therapy-known for its thermal and pharmacologic effects on circulation and inflammation--with cervical health exercises that enhance neuromuscular coordination and postural correction. This combined approach is designed to address both the vascular insufficiency and mechanical instability characteristic of this disease, thereby filling a gap in current clinical research and providing a more comprehensive, non-invasive treatment strategy.

Methods

Randomization and blinding

Patients were randomly assigned to the observation group (OG) or control group (CG) in a 1:1 ratio using a computer-generated random number table produced by the Department of Statistics at our hospital. Random numbers were sealed in consecutively numbered opaque envelopes by an independent research assistant not involved in recruitment or treatment. After patient enrollment, the attending nurse opened the next envelope in sequence to determine group allocation, ensuring allocation concealment.

Because the interventions involved different physical therapies, blinding of patients and treating nurses was not feasible. However, all data collectors and outcome assessors were blinded to group allocation. Statistical analyses were conducted by an independent statistician who was also blinded to treatment assignments. To minimize bias, the same clinical environment, standard nursing procedures, and monitoring protocols were applied to both groups.

General data

Eighty vertebral artery type cervical spondylosis patients treated in our hospital from October 2022 to October 2023 received selection and division into observation group (OG) and control group (CG) on average, with 40 cases each. Inclusion criteria: (1) All met relevant content of the Diagnostic Criteria for Traditional Chinese Medicine 18, and imaging examination results showed hyperplasia of uncinate vertebral joint; (2) age ranged 55-85 years old; (3) voluntarily participated and signed informed consent. Exclusion criteria: (1) Those with other types of cervical spondylosis; (2) those with severe liver, cardiovascular and cerebrovascular diseases, or malignant tumors; (3) those who were unwilling to participate in this research. This study was approved by the Second Affiliated Hospital of Anhui University of Traditional Chinese Medicine (Approval number: 2022-zj-26).

Treatment methods

The CG received treatment with acupuncture and moxibustion treatment and conventional symptomatic treatment. The patients received conventional cervical traction once a day for 20 days as a course of treatment. The nursing contents included introducing hospital ward environment, supervisor doctors and charge nurses, acupuncture and moxibustion, cervical traction, health guidance, etc.

On the basis of conventional treatment in CG, OG received cervical health exercises and traditional Chinese medicine wax therapy treatment. (1) Cervical health exercises: Patients were taught by qualified nurses who had participated in cervical health exercise training of hospital. The order of health exercises should be as follows: Look down at the abdomen; look back at the moon; look left and right; neck earning force; pinch acupoint between shoulder and ta chuei; pinch jiaji acupoints; self-tapping, kneading, and pressing on acupoints such as Fengfu, Fengchi, Houxi, and Baihui. 1-2 times a day, each time for 15 min. (2) Traditional Chinese Medicine wax therapy: The wax therapy procedure should receive performance by the same nurse. The medical paraffin melted into a liquid in a computer-controlled constant temperature wax therapy device, and then poured into a wax tray. The surface was waiting to cool and grow into a soft wax cake of 25 cm in length, 20 cm in width, and 2-3 cm in thickness. The traditional Chinese medicine formula consists of 10 g of folium artemisiae argyi, 5 g of polygonum cuspidatum, 6 g of fructus evodiae, 5 g of stir fried ramulus mori, 5 g of osmanthus branches, 5 g of phryma leptostachya, 7 g of root of Chinese thorowax, 7 g of Chinese angelica, 7 g of radix clematidis, 5 g of papaya, 5 g of caulis spatholobi, 10 g of radices sileris, 10 g of notopterygium root, 10 g of red peony root, 5 g of fructus liquidambaris, and 7 g of safflower. The doctor should adjust dosage according to individual condition of patients and process it into powder for later use. Nursing staff should first mix prepared traditional Chinese medicine with boiling water into a paste, spread it on a moderately sized medical plastic cloth, and then cover it with gauze (temperature of 41-45°), applying it to patients' neck, from Fengchi point to Dazhui point. Nursing staff should cover prepared wax cake (temperature of 41-45°) on top of traditional Chinese medicine, beyond scope of external application of Chinese medicine, then place a plastic film on wax cake, and finally cover patients with a cotton pad or blanket to keep warm. The treatment time should be 15-40 min, once a day, with 10 days as one course of treatment. The therapeutic effect received evaluation after two courses. (3) Skin and post-treatment nursing: Before treatment, nursing staff should inquire about a history of drug allergies, evaluate whether skin at application site is intact, whether there are blisters, papules, and patients' physical condition, strictly control indications and contraindications, and strictly control temperature of wax block to prevent burns. Nursing staff should clean skin of patients' treatment area before applying medicine. After completion of medicine application, patients should take a supine position and avoid high pillows. After wax therapy, patients should drink plenty of water and avoid direct exposure to wind and cold. Local areas should not be cleaned with cold water to prevent cold pathogens from invading and worsening conditions.

Observation indicators

(1) Clinical efficacy: The clinical treatment efficacy in both groups received evaluation. The therapeutic effect of treatment received formulation according to relevant content of the Diagnosis and Treatment Efficacy Standards for Traditional Chinese Medicine Diseases issued by the Administration of Traditional Chinese Medicine in China. Significant effectiveness: After treatment, patients' clinical symptoms completely disappeared, normal work resumed, and positive signs turned negative. Effectiveness: After

Table 1 General data in both groups

Groups	N	Gender [n (%)]		Age (years)
		Male	Female	
CG	40	21 (52.5)	19 (47.5)	67.15±3.97
OG	40	23 (57.5)	17 (42.5)	66.72±3.23
χ2/t		0.5		0.594
P		0.48		0.554

Table 2. Clinical efficacy in both groups

Groups	N	Significant effectiveness	Effectiveness	Ineffectiveness	Total effective rate [n (%)]
CG	40	17	15	8	32 (80.0)
OG	40	25	12	3	37 (92.5)
χ2		/	/	/	6.115
P		/	/	/	0.013

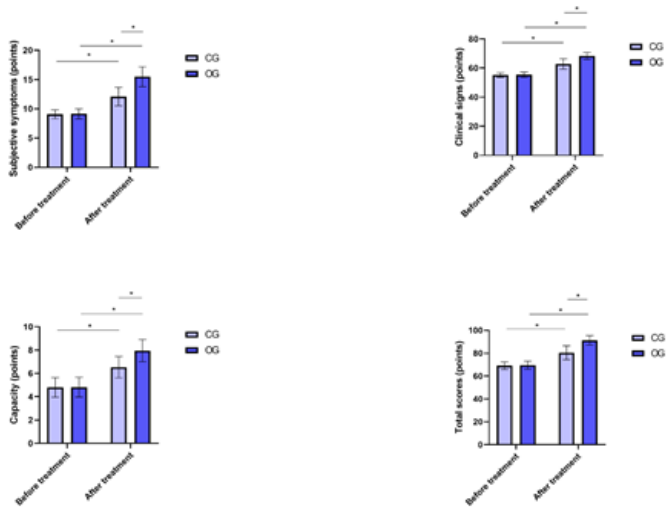

Figure 1. Quality of life in both groups

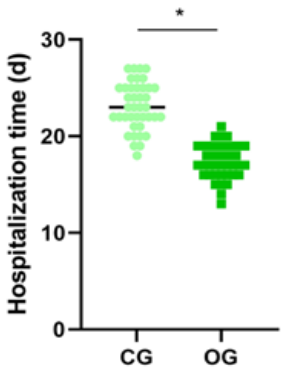

Figure 2. Hospitalization time in both groups.

treatment, patients' clinical symptoms remarkably improved, positive signs weakened, and patients were basically able to engage in basic daily work. Ineffectiveness: There was no marked improvement in patients' clinical symptoms after treatment. Total effective rate = (significant effectiveness+ effectiveness) cases / total cases * 100%. (2) Quality of life: The quality of life before and after treatment in both groups received evaluation with Clinical Assessment Scale for Cervical Spondylosis (CASCS). CASCS includes subjective symptoms (pain, dizziness, sympathetic symptoms, etc.), capacities (life, work, and society), and clinical signs (soft tissue signs, spinal cord compression signs, sympathetic nerve paralysis signs, etc.), totaling 100 points. The higher the scores of dimensions and total scores, the better the quality of life of patients. In this study, we adopted the 2019 revised version of the Clinical Assessment Scale for Cervical Spondylosis, developed by the Chinese Association of Rehabilitation Medicine, which has been widely used in clinical and rehabilitation research for cervical spondylosis (CASCS-2019; Chinese Association of Rehabilitation Medicine, 2019). (3) Hospitalization time: The average hospitalization time in both groups received recording.

Statistical analysis

The SPSS 27.0 software received application for processing data. The normality of continuous variables was examined using the Shapiro–Wilk test to determine whether parametric or non-parametric tests were appropriate. Quantitative data received expression in x ± s followed by t-test for comparison. Count data received expression in % followed by χ2 test. When $P < 0.05$, the difference was statistically significant.

Results

Comparison of general data between both groups

No statistical significance in general data exhibited between both groups ($P > 0.05$; Table 1), indicating comparability. Specifically, in the CG, there were 21 males (52.5%) and 19 females (47.5%), while in the OG, there were 23 males (57.5%) and 17 females (42.5%). The gender distribution between the two groups showed no significant difference ($P > 0.05$).

Comparison of clinical efficacy between both groups

The total effective rate in OG exhibited elevation relative to that in CG, indicating statistical significance ($P < 0.05$; Table 2).

Comparison of quality of life between both groups

Before treatment, no statistical significance in CASCS scores and total scores exhibited between both groups ($P > 0.05$). After treatment, CASCS scores and total scores in both groups exhibited elevation relative to those before treatment ($P < 0.05$), and OG exhibited elevation relative to CG, indicating statistical significance ($P < 0.05$; Figure 1).

Comparison of hospitalization time between both groups

The hospitalization time in OG exhibited depletion relative to that in CG, indicating statistical significance ($P < 0.05$; Figure 2).

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Discussion

Traditional Chinese medicine in China believes that vertebral artery type cervical spondylosis belongs to category of "dizziness", and essence and blood insufficiency, liver and kidney deficiency, etc. lead to "loss of nourishment of muscles and bones"; if one bends over a desk for a long time, it can cause chronic strain on cervical vertebra[19]. Thus, during clinical intervention stage, traditional Chinese medicine proposed a complete treatment plan and achieved satisfactory results.

Through cervical health exercises, techniques such as pressing, kneading, tapping, and pinching received application to acupoints such as Fengfu, Fengchi, Houxi, Baihui, etc., to unblock meridians, and promote qi and activate blood, which improves blood circulation in neck, eliminates aseptic inflammation, raises pain threshold of local tissues, fully extends spasmodic muscle tissue, and relieves muscle spasms[20]. The movements of forward flexion and backward extension, left and right lateral flexion, left and right rotation, chest expansion and shoulder shaking, quadrilateral resistance, and traction on pillow in cervical health exercises can elevate volume and strength of cervical muscles, stimulate cervical meridians and acupoints, expand cervical blood vessels, facilitate cervical blood circulation and lymphatic circulation, mitigate venous stasis and muscle spasms, eliminating discomfort such as pain, attenuating nerve stimulation, accelerating muscle tissue metabolism, ameliorating function of cervical joints, enhancing muscle strength of neck, shoulder, and back muscles, as well as tension of ligaments, joint capsules, and other tissues, improving blood supply to neck, and correcting poor neck posture, thereby strengthening stability of cervical vertebra and reducing further damage to cervical vertebra caused by mechanical changes of cervical vertebra[21]. This is consistent with previous research[22], where cervical exercises can effectively improve local symptoms and exert a marked impact on ameliorating local symptoms of cervical spondylosis.

Traditional Chinese medicine wax therapy is a physical therapy that applies heated paraffin as a heat-conducting medium to enhance local circulation, improve tissue metabolism, and relieve inflammation and pain[23]. Under thermal action, transdermal absorption of herbal components is accelerated. The multi-herbal wax formulation exerts synergistic effects in tonifying the liver and kidney, strengthening muscles and bones, unblocking meridians, promoting blood circulation, and alleviating pain and inflammation[24]. Representative herbs such as Folium artemisiae argyi, Polygonum cuspidatum, and Fructus evodiae primarily warm meridians, dispel cold and dampness, and relieve pain; others such as Radix Angelicae Sinensis, Caulis Spatholobi, and Notopterygium root promote blood activation and circulation, enhancing anti-inflammatory and analgesic actions.

Herein, after treatment, total effective rate in OG exhibited elevation relative to that in CG; CASCS scores and total scores in OG exhibited elevation relative to those in CG; hospitalization time in OG exhibited depletion relative to that in CG. These findings suggest that in clinical therapy of vertebral artery type cervical spondylosis, total treatment efficacy of cervical health exercises combined with traditional Chinese medicine wax therapy is satisfactory, hospitalization time of patients is markedly shortened, and quality of life is remarkably improved. This is because cervical health exercises combined with traditional Chinese medicine wax therapy further enhance effectiveness of traditional Chinese medicine. Traditional Chinese medicine wax therapy is a convenient, easy to operate, and minimally toxic treatment method, which exerts advantages of being painless and non-invasive, meeting treatment principles of "simplicity, convenience, effectiveness, and affordability" in traditional Chinese medicine therapies[25,26]. The cervical health exercises are simple and easy to learn, with less time and cost, and are not restricted by situation, which exert a good preventive effect on recurrence of cervical spondylosis; meanwhile, this method reflects continuity of nursing services, meets knowledge and nursing needs of discharged patients, and can also save medical resources and reduce burden on medical staff.

From a practical perspective, the combined approach of cervical health exercises and TCM wax therapy is highly adaptable for integration into routine clinical and community rehabilitation settings. Both interventions are non-invasive, low-cost, and require minimal specialized equipment, making them feasible for use in primary care institutions, rehabilitation centers, and even community health clinics. Nurses and rehabilitation therapists can be trained through standardized protocols to guide patients in performing cervical exercises safely and effectively, while wax therapy can be applied using portable temperature-controlled devices under supervision. Furthermore, this integrative therapy aligns with the "preventive treatment of disease" principle in TCM and supports the modern rehabilitation goal of functional recovery through self-management and continuous home-based care.

In tertiary hospitals, this combined protocol can serve as a supplementary non-pharmacologic therapy to enhance postoperative or conservative management outcomes for patients with cervical spondylosis. In secondary and primary healthcare settings, its simplicity and cost-effectiveness make it suitable for outpatient and community rehabilitation programs, helping reduce hospital readmissions and promoting long-term adherence to cervical care routines. By improving accessibility and continuity of care, this approach has the potential to enhance patient satisfaction, reduce economic burden, and strengthen the integration of traditional and modern rehabilitation medicine within multidisciplinary care models.

Although this study demonstrated the clinical efficacy of cervical health exercises combined with traditional Chinese medicine wax therapy in treating vertebral artery type cervical spondylosis, several limitations should be acknowledged. First, the sample size was relatively small and derived from a single medical center, which may limit the generalizability of the findings. Second, the follow-up period was confined to hospitalization and short-term outcomes; therefore, the long-term efficacy and recurrence rate were not assessed. Third, the study design did not include a sham or placebo-controlled group, which may introduce potential performance bias, even though assessor blinding was implemented. Future multicenter randomized controlled trials with larger sample sizes, extended follow-up, and mechanistic evaluations are warranted to further validate these findings and clarify the underlying biological pathways.

Conclusion

Cervical health exercises combined with traditional Chinese medicine wax therapy can effectively elevate cure rate,

shorten hospitalization time, and improve quality of life of patients with vertebral artery type cervical spondylosis. This enhances depth of nursing in traditional Chinese medicine at the level of "preventive treatment of disease", enriches overall nursing connotation of traditional Chinese medicine, makes patients feel care that hospital gives them, reflects "patient-centered" service concept, improves nursing service efficiency, and enhances patients' awareness and trust in traditional Chinese medicine nursing, which is worth further promoting. In the future, the integration of this combined therapy into standardized clinical pathways-especially through nurse-led training, home-based programs, and digital rehabilitation platforms-may provide a scalable, sustainable model for managing cervical spondylosis across different levels of healthcare systems.

Declarations

Declaration of Conflicting Interests

There are no conflicts of interest regarding this study.

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The present study received no funding.

Availability of data and material

The data sets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

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