Clinical Efficacy of Mongolian Medicine Silver Needle Combined with Cupping and Bloodletting Therapy in the Treatment of Cervical Spondylotic Radiculopathy (CSR)

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Abstract [**Objectives**] To observe the clinical efficacy of Mongolian medicine silver needle combined with cupping and bloodletting therapy in the treatment of cervical spondylotic radiculopathy (CSR). [**Methods**] A total of 120 patients diagnosed with CSR who received treatment at the International Mongolian Hospital of Inner Mongolia between October 2021 and October 2022 were selected and randomly divided into two groups: A test group and a control group, with 60 patients in each group. The patients in the test group received Mongolian medicine silver needle combined with cupping and bloodletting therapy, following the principles of syndrome differentiation in Mongolian medicine. In contrast, the patients in the control group received only the Mongolian medicine silver needle therapy. After treatment, the Mongolian medicine syndrome scores, visual analogue scale (VAS) scores, and total clinical therapeutic effects in the two groups of patients were compared both prior to and following the treatment. [**Results**] The improvement in VAS and Mongolian medicine syndrome scores in the test group was greater than that in the control group, with a statistically significant difference ($P<0.05$). The scores of the test group surpassed those of the control group, and this difference was also statistically significant ($P<0.05$). Furthermore, the overall therapeutic effect in the test group was 93.33%, which was markedly higher than 76.67% observed in the control group ($P<0.05$). [**Conclusions**] The therapeutic effect of Mongolian medicine silver needle combined with cupping and bloodletting therapy in the treatment of CSR is remarkable. This approach has demonstrated efficacy in alleviating patient pain and improving the functionality of the cervical vertebrae, thereby warranting clinical promotion and application.

Key words Cervical spondylotic radiculopathy (CSR), Mongolian medicine silver needle therapy, Cupping and bloodletting therapy, Clinical efficacy

1 Introduction

Cervical spondylotic radiculopathy (CSR) is a prevalent condition encountered in clinical practice, primarily resulting from cervical intervertebral degeneration, disc herniation, and hyperostosis. This condition manifests as neck and shoulder pain, radiating discomfort in the upper limbs, as well as symptoms such as numbness and weakness. These manifestations significantly impair the quality of life of affected individuals. According to a research report published by the World Health Organization, cervical spondylosis is ranked as the second most prevalent chronic disease among the top ten persistent chronic conditions globally[1]. Furthermore, it is estimated that over 900 million individuals worldwide are currently affected by cervical spondylosis[2]. CSR is the most prevalent form of cervical spondylosis, constituting approximately 60% of all cases[3]. CSR significantly impacts both the quality of life and occupational functioning of affected individuals, while also exerting considerable pressure on social healthcare resources. Consequently, investigating safer and more effective treatments to alleviate the symptoms experienced by CSR patients and enhance their quality of life holds substantial research significance. At the present stage, clinical applications of CSR can be categorized into two distinct approaches: surgical treatment and conservative treatment. Among these, conservative treatment has emerged as the preferred option for the majority of patients, owing to its advantages of enhanced safety, reduced trauma, and a lower incidence of complications. Mongolian medicine, as a significant component of traditional medical practices, possesses distinctive theoretical frameworks and extensive practical experience in the treatment of cervical spondylosis. Among the various traditional external therapeutic methods utilized in Mongolian medicine, the application of Mongolian silver needles, along with cupping and bloodletting therapy, stands out as a prominent method. Mongolian silver needle therapy is a traditional external therapeutic approach in Mongolian medicine. This technique employs specialized silver needles to administer both needling and warm moxibustion at fixed acupoints on the human body, thereby facilitating disease prevention, rehabilitation, and treatment. The therapeutic effects are achieved through the synergistic interaction of needling, warming, and specific stimulation of acupoints, which collectively elicit various biological responses within the body[4]. Mongolian cupping and bloodletting therapy aims to facilitate the dredging of meridians, regulate qi and blood, reduce swelling, and alleviate pain through the application of cupping and bloodletting at specific acupoints or regions of the human body. The objective of this study is to examine the clinical efficacy of Mongolian silver needle combined with cupping and bloodletting therapy in the treatment of CSR and offer novel insights and methods for clinical treatment.

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2 Information and methods

2.1 General information Patients diagnosed with CSR at the

Inner Mongolia International Mongolian Hospital, either as outpatients or inpatients, between October 2021 and October 2022 were selected for this study. A total of 120 cases were observed, with participants randomly assigned to either the test group or the control group, each consisting of 60 cases. In the two patient groups, the male-to-female ratio was randomized, and the age range was between 18 and 65 years. There was no statistically significant difference in the general information of the two groups ($P>0.05$), indicating that they were comparable.

2.2 Diagnostic criteria The diagnostic criteria for CSR were established based on the guidelines in the *Diagnostic and Therapeutic Standards of Mongolian Medicine*, published by the Department of Health of Inner Mongolia in 2007[5], and the 2012 edition of the *Diagnostic and Therapeutic Standards of Traditional Chinese Medicine*, developed by the State Administration of Traditional Chinese Medicine[6]. The potential medical history may encompass congenital deformities of the cervical vertebrae or acquired chronic strain-induced degenerative changes, as well as a history of trauma. The affected population primarily consisted of middle-aged and elderly individuals over the age of 40, particularly those engaged in occupations that require prolonged forward head posture. Clinical symptoms were characterized by restricted neck movement, accompanied by pain in the neck and shoulders, which may be exacerbated by posterior extension, as well as numbness and hypesthesia in the areas innervated by the affected nerve roots. Clinical signs included a positive brachial plexus tension test and a positive Spurling test.

2.3 Inclusion criteria Participants must meet the aforementioned CSR diagnostic criteria; be between the ages of 25 and 60 years, regardless of gender; have a disease duration ranging from 1 month to 3 years; not have received any treatment within the past month and refrain from using other treatments during the study period; and possess the ability to communicate verbally, actively cooperate with the treatment, and provide signed informed consent.

2.4 Exclusion criteria Individuals exhibiting abnormal imaging findings without corresponding clinical symptoms; those with a definitive diagnosis of other forms of cervical spondylosis; individuals with acute cervical disc herniation resulting from conditions such as tumors, tuberculosis, or bone fractures; patients presenting with numbness and pain attributable to non-disease entities, including radiohumeral bursitis and scapulohumeral periarthritis; individuals aged under 25 years or over 60 years; pregnant or breastfeeding women; individuals with significant cardiovascular or cerebrovascular diseases; those with liver or kidney function abnormalities; individuals with mental disorders; and patients demonstrating clear surgical indications for treatment.

2.5 Treatment methods The patients were randomly assigned to a test group and a control group, with each group comprising 60 cases. The test group received Mongolian medicine silver needle combined with cupping and bloodletting therapy, following the principles of syndrome differentiation in Mongolian medicine. The silver needle treatment was administered once daily, while cupping and bloodletting treatment was performed once weekly, with a treatment duration of two weeks constituting a single course of therapy. The control group received Mongolian silver needle treatment once daily for a duration of two weeks, constituting one course of treatment. The therapeutic effects of both the test group and the control group were evaluated. The silver needles, the necessary instruments for treatment, and cupping, were supplied by the Inner Mongolia International Mongolian Hospital.

2.5.1 Selection and operation of cupping acupoints. The acupuncture points utilized in Mongolian medicine included Heyi acupoint (situated in the interstice between the spinous process of the seventh cervical vertebra and the spinous process of the first thoracic vertebra), bilateral Jianqian acupoint (located anterior to the shoulder joint at the midpoint of the line connecting the anterior axillary line to the anterior shoulder angle), and bilateral Jianhou acupoint (positioned posterior to the shoulder joint at the midpoint of the line extending from the posterior axillary line to the posterior armpit angle). The patient was positioned in a seated posture, and a universal vacuum cupping device was employed to conduct a cupping procedure at the Heyi acupoint. After approximately 8 min, the cupping apparatus was removed, and the standard sterilization protocol was implemented. Subsequent to disinfection, a sterilized specialized three-pronged needle, with a diameter of 2 – 3 mm, a body length of 100 mm, and a tip length of 8 – 10 mm, was employed to swiftly puncture each of the three acupoints. The needle should be inserted into each of the three acupoints, utilizing five to seven stitches per point, followed by the application of a cupping apparatus over the needled area. After approximately 5 min, the blood cupping should be carefully removed, and any aspirated blood should be meticulously cleaned from the apparatus. Subsequently, the area should be bandaged with sterilized gauze to mitigate the risk of infection. The volume of bloodletting must be meticulously regulated in accordance with the patient's physical condition, the severity of the illness, and the color of the blood drawn. Cupping was conducted at the bloodletting site every other day. In cases where the disease did not respond to the initial treatment, subsequent interventions were administered at both the bilateral Jianqian and bilateral Jianhou acupoints. Cupping and bloodletting therapy was re-applied, utilizing a needle insertion depth of 2 – 3 mm in a straight manner. A total of two treatments were conducted. Additionally, Mongolian medicine silver needle therapy was incorporated, targeting the same acupoints as those utilized in the control group.

The acupuncture points utilized in meridian-dredging acupuncture included Heyi acupoint, bilateral Jianqian and Jianhou acupoints, as previously described. The patient assumed a prone position, and the designated acupoint site was systematically sterilized using iodine swabs. Subsequently, a sterilized long needle or a long, sharp needle was employed, with the needle being inserted

to a depth of 3 to 4 inches, adjusted according to the patient's adiposity. The patient may experience a sensation of numbness in the soles of the feet, with the needle being transfixated three times before removal.

2.5.2 Operation of Mongolian medicine silver needle therapy in the control group. The acupuncture points were Heyi acupoint, bilateral Jianqian and Jianhou acupoints, as previously described. The patient was positioned in a prone orientation, and the acupuncture points were systematically sterilized using iodine swabs. Disposable acupuncture needles were employed, with the depth of insertion being adjusted flexibly based on the patient's body composition and specific medical condition. Following insertion, the needles were retained in place for 25 min.

2.5.3 Observation period. In this study, a comprehensive observation period of one week was utilized to evaluate the therapeutic effect, primarily focusing on the symptoms. A comparative analysis of the conditions prior to and following the treatment was conducted.

2.6 Scoring Assessments were performed both prior to and following the treatment, utilizing two distinct scoring methods. The Mongolian medicine syndrome scores encompassed symptoms including discomfort in the neck and shoulders, back pain, upper limb pain and numbness, as well as pain and numbness in the fingers. Each symptom was assigned a score ranging from 0 to 3 points, with higher scores reflecting a greater severity of pain and discomfort. The visual analogue scale (VAS) operated on a scoring system where a score of 0 points signified the absence of pain, while a score of 10 points represented extremely severe pain. Thus, a higher score correlated with an increased severity of pain.

2.7 Determination of therapeutic effect In accordance with the *Diagnostic and Therapeutic Standards of Traditional Chinese Medicine*, the following criteria had been established to assess the therapeutic effect. Clinical Recovery: the clinical symptoms and signs of the patients completely resolved, with full mobility restored to the neck and upper limbs, and a negative result on the brachial plexus tension test. Markedly Effective: there was a significant improvement in clinical symptoms and signs, with neck and upper limb activities largely returning to normal, and the brachial plexus tension test yielding a negative result. Effective: clinical symptoms, signs, and movement of the neck and upper limbs showed some improvement, although the brachial plexus tension test remained positive. Ineffective: the patient's clinical symptoms and signs did not improve, neck and upper limb movement remained restricted, and the brachial plexus tension test continued to be positive. Total clinical therapeutic effect = (Number of clinically cured cases + Number of markedly effective cases + Number of effective cases)/Total number of cases × 100%.

2.8 Statistical analysis In this study, RevMan 5.3 software was utilized to conduct a systematic evaluation. For the data from the clinical control trial, appropriate statistical tests were selected based on the type of data: a *t*-test was employed for measurement data, while a *chi*-square test was applied for count data. If the data were not normally distributed, a rank-sum test was utilized.

3 Results and analysis

3.1 Comparison of VAS scores prior to and following the treatment between the two groups Before the treatment was administered, the VAS scores of the patients in both the test group and the control group were recorded. The score for the test group was (7.25 ± 1.36) points, while the control group had a score of (7.32 ± 1.41) points. A *t*-test was conducted ($t = 0.301$), and the results indicated that the difference was not statistically significant ($P > 0.05$), suggesting that the pain levels of both groups were comparable prior to the treatment. After completing the treatment, the VAS scores of the two groups were measured again. The test group's score decreased to (2.15 ± 0.82) points, and the difference was statistically significant compared to the pre-treatment period ($t = 25.467$, $P < 0.05$). This finding clearly indicates that the pain in the test group was significantly alleviated following the treatment. The score of the control group decreased to (3.58 ± 1.05) points, which was lower than the score recorded prior to the treatment. This difference was statistically significant, as indicated by the test results ($t = 18.732$, $P < 0.05$), demonstrating that pain levels in the control group were also reduced following the treatment. Further comparison of the scores between the two groups following the treatment revealed that the VAS score for the test group was significantly lower than that of the control group. This difference was statistically significant, as indicated by the *t*-test ($t = 8.245$, $P < 0.05$). These results suggested that the treatment program for the test group was more effective in providing pain relief compared to that of the control group.

3.2 Comparison of clinical therapeutic effects between the two groups of patients In this study, the treatment effects of the test group and the control group were analyzed in detail. The total number of patients in the test group was 60, of which 18 cases achieved the standard for clinical recovery, 25 cases were classified as markedly effective, 13 cases were effective, and 4 cases were deemed ineffective. Consequently, the overall therapeutic effect of the test group was calculated to be 93.33%. The control group also comprised 60 patients, which included 10 cases of clinical recovery, 18 markedly effective cases, 18 effective cases, and 14 ineffective cases. The overall therapeutic effect rate was 76.67%. To assess whether the difference in treatment effects between the two groups was statistically significant, a *chi*-square test was conducted on the overall therapeutic effects of both groups. The results indicated a *chi*-square value (χ^2) of 6.429, with a *P*-value of less than 0.05. This finding suggested that the difference in overall therapeutic effects between the two groups was statistically significant. Furthermore, the overall therapeutic effect of the test group was found to be significantly greater than that of the control group, indicating that the treatment method employed by the test group was more advantageous in terms of overall therapeutic

efficacy.

4 Discussion

Mongolian medicine posits that silver needle therapy is effective in facilitating the flow of meridians, harmonizing qi and blood, regulating bodily elements, and enhancing the body's resistance[7]. Additionally, Mongolian cupping and bloodletting therapy is recognized as a traditional external therapy in Mongolian medicine. This treatment method exerts a direct impact on the affected area and demonstrates a rapid onset of action. Cupping therapy provides mechanical stimulation and warmth, which can enhance blood circulation and alleviate blood stasis, thereby contributing to the cessation of pruritus[8]. Relevant studies indicate that Mongolian cupping and bloodletting therapy exhibits a significant anti-inflammatory effect, resulting in a reduction of serum levels of TNF-α, IL-1β, and IL-6. Mongolian cupping and bloodletting therapy effectively counteracts free radical damage and enhances tissue antioxidant capacity by elevating serum SOD activity and GSH content[9]. CSR is classified within the category of limb Baimai disease, also known as white pulse disorder in Mongolian medicine. This condition primarily arises from an imbalance among the "three roots", Qisu and Xieriwusu, alongside an increase in Badagan – Xieriwusu. This imbalance results in stagnation in the neck region, which adversely affects blood vessels and impairs the circulation of blood and qi[10]. In Mongolian medicine, this condition is clinically classified into three distinct types: Heyi hyperactivity type, Qisu – Xila hyperactivity type, and Badagan hyperactivity type. The etiology of the disease primarily involves the protrusion of intervertebral discs or hyperplasia of the facet joints in the cervical region, which leads to radiating pain and numbness in various areas, including the shoulders, back, elbows, fingers, and other regions of the body, as well as restricted neck mobility. The numbness experienced is attributed to pressure on the white pulse, and the symptoms may manifest in different parts of the body. CSR primarily results from irritation of the nerve roots, which occurs due to compression caused by the protrusion of intervertebral discs and the biomechanical load associated with osteophyte proliferation. Although the pathogenesis of CSR remains incompletely understood, it is widely accepted that direct compression of the nerve roots by protruded intervertebral discs, along with the curvature of osteophytes, can induce sensory, motor, and reflex abnormalities in the affected nerve root regions. At present, there are three predominant theories regarding the pathogenesis of the disease. (i) Mechanical compression theory. As the cervical vertebrae undergo aging, degenerative changes ensue, leading to a reduction in the intervertebral space, protrusion of intervertebral discs, and the proliferation of osteophytes at the posterior margin of the vertebral body. These changes ultimately result in the compression of the nerve root. (ii) Instability theory. Degenerative changes in the cervical vertebrae are frequently associated with instability of the vertebral structure. This instability can result in abnormal movement of the vertebral joints, which may stimulate the peripheral nerves and disrupt blood flow in the surrounding blood vessels, leading to localized ischemia of the nerve roots. (iii) Blood supply disorder theory. In addition to the aforementioned factors, disorders of blood supply to the spinal cord also play a significant role in the pathogenesis of cervical spondylosis. Degenerative changes in the cervical vertebrae may induce vasospasm of the spinal cord by stimulating the sympathetic nerves, which can lead to nerve injury[11-13]. In recent years, numerous studies have demonstrated that Mongolian medicine bloodletting therapycan significantly decrease serum levels of TC, TG, LDL-C, while simultaneously increasing HDL-C in individuals with hyperlipidemia. Furthermore, this therapeutic approach has been shown to positively influence parameters associated with blood rheology and enhance blood flow velocity[14]. Clinical analyses and contemporary research have demonstrated that the application of bloodletting therapy involves the penetration of the skin, soft tissues, and the walls of blood vessels by the bloodletting device. This process results in the extrusion of lipoproteins, fragments of necrotic blood cells, and other constituents from the stagnant sidestream adjacent to the vessel walls, driven by the internal pressure of the blood within the vessels[15]. The silver needle utilized in Mongolian medicine has the capacity to modulate the nervous-endocrine-immune network of the body through its acupuncture effects, thermogenic properties, and targeted stimulation of acupoints. This modality exerts various therapeutic effects, including the warming of meridians, regulation of blood quality, anti-inflammatory actions, analgesic effects, sedative-hypnotic properties, and enhancement of the body's immune response. Collectively, these effects contribute to the regulation of bodily functions and the treatment of diseases[16].

5 Conclusions

This study investigated the effects of Mongolian silver needle therapy combined with cupping and bloodletting therapy, as compared to standard Mongolian medical treatment, through clinical observation of 120 patients diagnosed with CSR. The findings indicated that the Mongolian silver needle therapy combined with cupping and bloodletting therapy significantly reduced patient pain and enhanced cervical vertebral function. The overall therapeutic efficacy of this combined approach was found to be 93.33%, which was markedly higher than 76.67% observed with the sole application of Mongolian silver needle therapy. This therapy offers a novel and effective approach for the treatment of CSR, which not only enhances the array of clinical treatment options available, but also underscores the significance of traditional Mongolian medicine in contemporary medical practices. Nevertheless, during the promotion and implementation phases, it remains essential to enhance the training of healthcare personnel and standardize operational

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cyrrhizae Radix Et Rhizoma (Gancao) 10 g. Second visit: Cough and wheezing improved, edema in the lower limbs reduced, with occasional abdominal distension and poor appetite. The dosages of Astragali Radix and Codonopsis Radix in the previous formula were reduced by 15 g, and Fried Crataegi Fructus (Jiaoshanzha), Fried Galli Gigerii Endothelium Corneum (Chaojineijin) (15 g each), and Magnoliae Officinalis Cortex (Houpu) (10 g) were added. Third visit: Significant improvement in wheezing and cough, reduced limb edema, and resolved abdominal distension. Treatment was continued with Jinkui Shenqi Pill to consolidate therapeutic effects. Follow-up after six months showed no recurrence of edema.

This disease is identified as lung distension with the pattern of yang deficiency and water flooding. The formula utilizes Astragali Radix to tonify qi, activate yang, promote diuresis, and reduce edema, making it the primary herb for reinforcing the lung, spleen, and kidney. Common Monkshood Daughter Root (Fupian) and Cinnamomi Ramulus are included to warm and strengthen kidney yang, thereby enhancing qi transformation through warming and unblocking actions. Mori Cortex, Plantaginis Semen, Descurainiae Semen Lepidii Semen, and Platycodonis Radix work synergistically to drain lung heat, alleviate wheezing, promote diuresis, reduce edema, and diffuse lung qi. Polyporus, Poria, and Alismatis Rhizoma act to promote diuresis and eliminate dampness, while Salviae Miltiorrhizae Radix Et Rhizoma and Curcumae Rhizoma activate blood circulation and regulate qi movement. Pheretima is employed to unblock collaterals and calm wheezing, whereas Pinelliae Rhizoma and Perillae Fructus direct qi downward and resolve phlegm. Cinnamomi Ramulus further aids in diffusing lung qi, while Eucommiae Cortex and Cinnamomi Cortex anchor qi to relieve wheezing. Finally, Aurantii Fructus Immaturus (Zhishi) and Magnoliae Officinalis Cortex leverage the exterior-interior relationship between the lung and large intestine to diffuse lung qi and unblock bowel function.

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procedures to ensure the safety and efficacy of treatments. Additionally, further in-depth investigations into the mechanisms of action should be conducted to establish a more robust theoretical foundation for the optimization of therapy.

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