

Clinical Efficacy of Motion Acupuncture in the Treatment of Stiff Neck

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Abstract: This article aims to explore the clinical efficacy of motion acupuncture in the treatment of stiff neck. Thirty patients with stiff neck who went to the Dazhou integrated Traditional Chinese Medicine & Western Medicine Hospital between June 2023 and May 2024 were selected for the treatment with motion acupuncture. The treatment method of motion acupuncture include locating the target near the neck muscle pain area by patient's descriptions and dynamic tests and confirm the responsible muscle causing the lesion. A specification of 0.25×40 mm motion acupuncture needle is used to perform subcutaneous puncture along the positive target and tense muscles in the painful area. The needle is inserted into the superficial fascia and does not penetrate the muscles. The needle is retained for 30 minutes. The patients need to make some neck movements under the guidance of the doctor. The neck movements include forward flexion, backward extension, left and right lateral flexion, left and right rotation, and 360° rotation. Every patient was treated only once. Comparisons were made before and after the treatment. The doctor evaluated the patient's neck pain (Visual Analogue Scale, VAS) score, cervical range of motion score, cervical dysfunction index (Neck Disability Index, NDI) score, and clinical efficacy and safety. After one treatment with motion acupuncture, the patient's neck pain (VAS) score and cervical dysfunction index (NDI) score significantly decreased ($P<0.01$), and the cervical range of motion score significantly increased ($P<0.01$). The cure rate is 73.3% and the effective rate is 100%. During the treatment period, no serious adverse reactions occurred in all patients. The research results show that the use of motion acupuncture for the treatment of stiff neck has good therapeutic effects, rapid effectiveness, significant and immediate analgesic effects.

1. Introduction

Stiff neck is a common soft tissue injury which belongs to the category of "acute neck pain" in western medicine [1]. The strain or torn of neck muscles, ligaments and tendons are caused by improper sleeping position, pillow discomfort, or sudden head movements. And they are mainly manifested as simple strong neck pain with limited movement. Stiff neck usually does not cause serious health problem. But it can cause significant discomfort and pain that interferes with daily life and work. Therefore, it has great significance to seek an effective and fast-acting treatment to

improve the quality of patient's life. Motion acupuncture is invented by Dr. Chen Decheng, a well-known acupuncture expert, who made some developments on the traditional acupuncture methods, combined with his nearly 30 years of clinical experience in acupuncture. It is a new type of acupuncture therapy that can be used to treat various painful diseases caused by soft tissue injuries. It is based on the program of the "Huangdi Neijing". And on the basis of meridian tendons, soft tissue injuries and trigger points theories, breaking through the traditional idea of static needle retention and waiting for qi, the therapy adopts the operation method of dynamic needle retention and move with needle. In the process of motion acupuncture, the tendon knots are loosened to solve the pain problem while finding the various tendon knots that cause the meridians to be blocked, and using dynamic needle retention and needle movement [2]. Acupuncture is a combination of traditional acupuncture therapy and modern exercise therapy, which fully embodies the advantages and characteristics of the combination of traditional Chinese medicine and modern treatment methods. It is a supplement and innovation to the existing acupuncture therapy. It made new breakthrough and improvements about the treatment methods of stiff neck. In this study, motion acupuncture was used to treat stiff neck, and the effect was remarkable. The report is as follows.

2. Clinical information

2.1. General information

In this study, 30 stiff neck patients who received treatment in the rehabilitation department of Dazhou integrated Traditional Chinese Medicine & Western Medicine Hospital from June 2023 to May 2024 were selected as the research subjects. Cases were screened strictly according to the diagnostic criteria, inclusion criteria and exclusion criteria. The cases in the group were treated with motion acupuncture.

2.2. Diagnostic standard

According to the Diagnostic Efficacy Standard of Traditional Chinese Medicine disease and the 2017 Clinical Practice Guidelines for Neck Pain issued by the American Physical Therapy Association (APTA) [3], the diagnostic standard for stiff neck are as follows:

(1) Patients have no history of trauma, stiff neck is usually caused by improper sleeping posture or invasion by wind and cold.

(2) The patient's symptoms are acute and the duration of the disease does not exceed 72 hours.

(3) The main symptoms include pain and soreness in one side of the neck after sleep, which can radiate to the shoulders and back, leading to limited mobility. The pain on the affected side may be worsen during movements. And in some serious cases, the head may lean towards the affected side.

(4) The affected neck muscles may experience spasms, and there may be pres-sure pain in areas such as the sternocleidomastoid muscles, trapezius, scalene, rhomboid, and levator scapulae muscles. In areas of muscle tension, there may be tissue changes like palpable lumps or cord .

2.3. Inclusion Standard

(1) Meets the above diagnostic standard.

(2) Age ranges from 18 to 60 years old.

(3) The patients voluntarily accept the treatment and sign an informed consent form.

2.4. Exclusion Standard

(1) Patients with serious cervical diseases such as osteoporosis, cervical fractures, cervical spondylolisthesis, cervical disc herniation, or cervical foramen stenosis.

(2) Existence of serious underlying diseases, including but not limited to cardiovascular and cerebrovascular diseases, liver and kidney dysfunction, hematopoietic system diseases, immune system diseases, and coagulation dysfunction.

(3) Patients with simple acute neck sprains, or with arthritis.

(4) Patients with serious skin diseases, skin infections at the treatment site.

(5) Patients with serious mental illness, or unwilling to cooperate with the study.

3. Treatment Method

All subjects were enrolled in the motion acupuncture group. The treatment method of motion acupuncture: locate the target near the neck muscle pain area by patient's descriptions and dynamic tests and confirm the responsible muscle causing the lesion. A specification of 0.25×40 mm motion acupuncture needle is used to perform subcutaneous puncture along the positive target and tense muscles in the painful area. The needle is inserted into the superficial fascia and does not penetrate the muscles. The needle is retained for 30 minutes. The patients need to make some neck movements under the guidance of the doctor. The neck movements include forward flexion, backward extension, left and right lateral flexion, left and right rotation, and 360° rotation. Every patient was treated only once.

4. Curative Effect Observations

4.1. Observation index

(1) Neck pain. The visual analogue scale (VAS) [4] score was used to assess the level of pain. Visual analogue scale: Scored from 0 to 10, 0 indicate no pain and 10 indicate unbearable severe pain. Evaluations were performed before treatment and after 1 treatment.

(2) Degree of cervical mobility limitation. The range of motion of the neck was assessed by the Cervical Spine Activity Scale score. Cervical Spine Activity Scale Score: The measurement method refers to the measurement method of cervical spine mobility in the "Rehabilitation Therapy Assessment". The range of motion of the cervical spine is measured with a protractor. The range of motion of the patient's neck is measured in left or right flexion, left or right rotation. Evaluations were performed before treatment and after 1 treatment.

(3) Influence on the quality of daily life. The Neck Disability Index (NDI) [5, 6] was used. Cervical Spine Dysfunction Index (NDI) score: The final score including two parts: the first one is neck pain and related symptoms. The other one is the ability to perform activities in daily life. Each part consists of 10 questions, each question has six answers (score of 0-5). The minimum score for each part is 0 and the maximum is 50. The total score of the two parts is 100. A higher score indicates a greater degree of dysfunction. The total score between 0-20 is normal, 21-40 is mild impairment, 41-60 is moderate impairment, 61-80 is severe impairment. Over 80 points is complete impairment. Evaluations were performed before treatment and after 1 treatment.

4.2. Curative Effect Evaluation

Refer to the patient global assessment (PGA) [7] criteria, patients make a subjective general evaluation of the treatment efficacy, including five levels: significant improvement, general

improvement, ineffective, deterioration, and severe deterioration. The evaluations were performed after 1 treatment.

4.3. Statistical process

SPSS 24.0 software was used for statistical analysis. A comparison is made in the metrology data group. The paired t-test was used for the data that follows a normal distribution, and the non-parametric Wilcoxon sign rank sum test was used for the data which don't follow a normal distribution. It has statistical significance if $P < 0.05$.

4.4. Treatment outcomes

(1) General information of patients: A total of 30 patients with stiff neck were recruited in this study. Among them, there are 11 males and 19 females. The maximum age is 59 years old and the minimum age is 18 years old. The longest duration of the disease is 55 hours, and the shortest is 2 hours. General information such as patient gender, age, duration of disease, and affected side are detailed in Table 1.

Table 1: General information of patients.

Group	Cases	Gender		Age(y)			Duration of disease(h)			Affected side	
		Male	Female	Max	Min	Average($\bar{x} \pm s$)	Max	Min	Average($\bar{x} \pm s$)	L	R
Motion acupuncture group	30	11	19	59	18	34.03 \pm 10.26	55	2	14.27 \pm 14.98	14	16

(2) VAS score of patients before and after treatment.

The VAS score before treatment is 5.17. And it turned into 1.53 after treatment. The VAS scores of the patients are significantly reduced after treatment ($P < 0.01$). See Table 2 for details.

Table 2: VAS score of patients before and after treatment.

Group	Cases	Before treatment($\bar{x} \pm s$)	After treatment($\bar{x} \pm s$)
Motion acupuncture group	30	5.17 \pm 1.23	1.53 \pm 0.63 ¹⁾

Note: Compared with this group before treatment, 1) $P < 0.01$.

Table 3: Cervical range of motion before and after treatment.

Group	Cases	Before treatment		After treatment	
		Left or right cervical flexion($\bar{x} \pm s$)	Left or right rotation($\bar{x} \pm s$)	Left or right cervical flexion($\bar{x} \pm s$)	Left or right rotation($\bar{x} \pm s$)
Motion acupuncture group	30	30.80 \pm 11.49	28.93 \pm 12.74	45.50 \pm 7.81 ¹⁾	60.50 \pm 12.20 ¹⁾

Note: Compared with this group before treatment, 1) $P < 0.01$.

(3) Comparison of cervical spine mobility before and after treatment.

The average degree of left or right cervical flexion before treatment is 30.80°, and the average

degree of left or right cervical flexion after treatment is 45.50°. The average degree of left or right rotation of the cervical spine before treatment is 28.93°, and the average degree of left or right rotation of the cervical spine after treatment is 60.50°. The left or right lateral flexion of the cervical spine and the range of motion of left or right rotation of the cervical spine are lower than those before treatment ($P < 0.01$). See Table 3 for details.

(4) Comparison of NDI score before and after treatment.

The average NDI score before treatment is 31.70, and the average NDI score after treatment is 15.27. The NDI score of cervical spine is significantly reduced after treatment ($P < 0.01$). See Table 4 for details.

Table 4: NDI scores before and after treatment.

Group	Cases	Before treatment($\bar{x} \pm s$)	After treatment($\bar{x} \pm s$)
Motion acupuncture group	30	31.70 \pm 12.30	15.27 \pm 7.78 ¹⁾

Note: Compared with this group before treatment, 1) $P < 0.01$.

(5) Clinical efficacy of patients.

After treatment, the cure rate is 73.3% and effective rate is 100%. See Table 5 for details.

Table 5: Clinical efficacy of patients.

Group	Cases	Significant improvement	General improvement	No effect	Worsen	Serious deterioration	Recovery rate	Effective rate
Motion acupuncture group	30	22	8	0	0	0	73.3%	100.0%

(6) Occurrence of adverse reactions.

In this experiment, only 1 subject had adverse reaction which is fainting during acupuncture. The patient continued to received the treatment after recovery. This one is also included in the statistics.

5. Typical case

Patient Wang, male, 27 years old, clerk, reported that he suddenly felt neck pain and discomfort when he woke up this morning. And his cervical spine could not bend or rotate to the right side. Physical examination: stiffness in the posterior part of the left neck, pain in the left neck and left shoulder, he was in so much pain that he refused to be pressed, and obvious tenderness in the trapezius muscle. The neck is bent forward 10°, bend back 20°, bent 45° to the left, bent 10° to the right, rotated 60° to the left, rotated 10° to the right. He need to make waist rotation when turn his head and neck. Diagnosis: stiff neck. Treatment: Motion acupuncture therapy is used to find and confirm the key responsible muscles that cause the lesion and confirm the target according to the patient's description and dynamic tests. Then, a specification of 0.25 \times 40 mm motion acupuncture needle is used to perform subcutaneous flat puncture along the positive reaction point and tight area of the muscles in the painful area. This procedure need to pay particular attention to ensure that the needles stay within the superficial fascia and does not penetrate deep into the musculature. The needle is retained for 30 minutes. During this period, the patient performs a series of neck exercises under the guidance of the doctor, including forward flexion, backward extension, left and right lateral flexion, left and right rotation, and 360° rotation. After one treatment of motion acupuncture, the patient reported that the pain was significantly relieved, the range of motion of the neck was significantly increased, and the treatment effect was remarkable.

6. Discussion

Stiff neck is a common neck discomfort symptom which is usually caused by improper sleeping posture or excessive fatigue of the neck muscles. And it is manifested by neck stiffness, pain, limited movement, and may even be accompanied by involved pain such as headache, shoulder and back pain. Nowadays, it makes neck muscles overtired when people spend long time on smart phone, computer or desk work. Stiff neck is more likely to occur at night than before. Stiff neck is often found when you wake up in the morning, which brings a lot of inconvenience to the patient's life and work. Although stiff neck usually does not cause serious health problems, it can cause remarkable discomfort and pain that interferes with daily life and work. Therefore, it has great significance to seek an effective and fast-acting treatment to improve the quality of patient's life. For patients with stiff neck caused by long-term incorrect sitting posture, sleeping posture and bad lifestyle habits, health education and lifestyle guidance should be strengthened to prevent the occurrence of stiff neck. In daily life, you can prevent stiff neck by choosing a pillow with a suitable height and firmness, paying attention to keep your neck warm, keeping a good sitting and sleeping posture, avoiding using electronic devices with your head bowed for a long time, and doing neck muscle exercises to enhance muscle strength and flexibility. When stiff neck occurs, patients can apply warm compresses and light massage to the affected area to help relieve muscle spasms and pain. Medications used to treat stiff neck include non-steroidal anti-inflammatory drugs that can relieve pain and inflammation, such as ibuprofen, aspirin. Muscle relaxants used to relieve muscle spasms, such as tropisetron, baclofen. There are also strong painkillers such as ceramides can help. However, because of the side effects of these drugs, patients do not accept them well. They prefer physical therapy methods such as acupuncture, massage, cupping, scraping, ultrasound, ultrashort wave, traction, and wax therapy.

Motion acupuncture is a new type of acupuncture therapy that can be used to treat various painful diseases caused by soft tissue injuries. In the treatment of diseases with motion acupuncture, the patient is guided by a doctor to perform active, passive and load exercises with needles during the motion acupuncture process. It is a comprehensive acupuncture therapy that combines a series of theories such as meridians, acupuncture, anatomy and kinesiology. It is mainly used to treat various pain syndromes and some internal organ diseases caused by soft tissue injuries. Motion acupuncture is treated with a special patented needle called "motion acupuncture needle" during the treatment process. The "motion acupuncture needle" retains the intuitive shape of the traditional acupuncture needle. But it has been reformed in the microstructure. The point of the motion acupuncture needle is the same as that of the filiform needle, which is a circular cross-section. And the needle body is a polygonal cross-section, which has the dual role of stagnant needle and crochet needle, so that the stagnation of the needle is enhanced, easy to operate, and the curative effect is enhanced. Motion acupuncture increases the stimulation of the local lesion or the corresponding acupoints. It can quickly loosen the soft tissue, not only has a significant therapeutic effect on soft tissue injuries and various neck, shoulder, waist and leg pain, but also can treat various clinical diseases through the stimulation of acupuncture points. Combined with the understanding of pain in modern Chinese and Western medicine, the trinity treatment method of targeting, acupuncture, and exercise is proposed [8]. Indeed, according to the theory of "pain-point needling" and "knot-point needling", the target is the point or site of the patient's pain and dysfunction. In the eyes of the doctor, these points will be the needling points. Including pain points, tenderness points, pain stimulation points, and tendon lesions [2]. Acupuncture is characterized by the fact that after acupuncture, the patient take exercises with needle in his body. The "motion acupuncture needle" has a greater effect in implementing acupuncture assisted needling, and has a faster effect on muscle release during exercise. The acupuncture method of motion acupuncture is mostly subcutaneous

superficial puncture, which is used for targeted therapy [9]. The mode of exercise is mainly active exercise, supplemented by passive exercise, and appropriate load exercise. The range of movement is limited by the physical condition. Confirm the target, accurate acupuncture and appropriate exercise are the three major steps of acupuncture. Target is the most important thing. Acupuncture is the key point in operating process. Exercise is the important auxiliary procedure. The origin of acupuncture is derived from the classical acupuncture theory and technique, which is the product of the combination of classical acupuncture theory and technique and modern medical theory. Motion acupuncture therapy combines the selection of Ah Shi acupoints, tender points and trigger points, which lays the foundation for the determination of therapeutic targets in dynamic tendon acupuncture therapy. The identification of the target provides a guarantee of therapeutic efficacy.

The results of this study showed that acupuncture therapy could effectively treat stiff neck, relieve pain and restore cervical range of motion. The neck pain (VAS) score and cervical spine dysfunction index (NDI) score were significantly lower than those before treatment ($P < 0.01$). And the cervical spine mobility score was significantly higher than that before treatment ($P < 0.01$). In addition, the treatment of stiff neck with moving tendon acupuncture showed significant effect after only one treatment. The cure rate is 73.3%. And the effective rate is 100%. This study confirmed that the treatment of stiff neck has good clinical efficacy. Motion acupuncture therapy can effectively alleviate neck pain and limited movement symptoms of patients by dynamic needle retention and exercising with needle. This therapy is simple, safe and effective, and has a rapid effect, which is worthy of clinical application. There are still shortcomings in this study, such as too few treatments, small sample size, no randomized control, no follow-up. A multi-center large-sample, randomized controlled, and long-term follow-up study can be carried out in the future to further verify the results of this study.

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