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Clinical Study

Treatment of neck type cervical spondylopathy with Zheng's Jin Gou Diao Yu (gold-hook-fishing) acupuncture method: a randomized controlled trial

郑氏"金钩钓鱼"针刺法治疗颈型颈椎病：随机对照研究

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Abstract

Objective: To observe the clinical effect of Zheng's Jin Gou Diao Yu (gold-hook-fishing) acupuncture method versus ordinary acupuncture on superficial fascia for treating neck type cervical spondylopathy in Kyrgyz.

Methods: A total of 64 Kyrgyz patients conforming to the diagnostic criteria of neck type cervical spondylopathy were included. The patients were randomized into a Zheng's Jin Gou Diao Yu (gold-hook-fishing) acupuncture group and a conventional acupuncture group, with 32 cases in each group. Patients in the Zheng's Jin Gou Diao Yu (gold-hook-fishing) acupuncture group were treated with Zheng's Jin Gou Diao Yu (gold-hook-fishing) acupuncture method to stimulate the superficial fascia, the stimulation sites were primarily located at bilateral sides of the cervical vertebra as well as the trigger points in shoulder-neck region; patients in the conventional acupuncture group were punctured at the same acupoints, with twirling reducing method, and the depth of insertion was determined by the treated region. Patients in both groups received treatment every day for a succession of 5 d as a course, with a 2-day interval between 2 courses, and the whole treatment lasted for 3 courses. After 3 courses of treatment, the McGill pain questionnaire (MPQ) and neck disability index (NDI) were measured to compare the clinical effect between the two groups.

Results: After treatment, scores of MPQ and NDI scale dropped when compared with those before treatment, and the differences showed statistical significance (all $P<0.05$); scores of MPQ and NDI in the Jin Gou Diao Yu (gold-hook-fishing) acupuncture group were substantially lower than those in the conventional acupuncture group, and the differences showed statistical significance (all $P<0.05$). The total effective rate was 96.9% in the Jin Gou Diao Yu (gold-hook-fishing) acupuncture group and the cured rate was 78.1%, which were higher than 81.3% and 40.6% in the conventional acupuncture group, and the differences showed statistical significance (both $P<0.05$).

Conclusion: Zheng's Jin Gou Diao Yu (gold-hook-fishing) acupuncture method by stimulating superficial fascia to treat cervical spondylopathy in Kyrgyz can produce a better clinical effect than conventional acupuncture treatment, and is effective in improving pain and stiffness in patients, and thus is worth clinical popularization.

Keywords: Acupuncture Therapy; Cervical Spondylopathy; Neck Pain; Spondylosis; Pain Measurement; Kyrgyz; The Belt and Road Initiative

【摘要】目的：观察郑氏"金钩钓鱼"针法刺激浅筋膜与常规针刺治疗吉尔吉斯斯坦人颈型颈椎病的临床疗效差异。**方法：**在吉尔吉斯斯坦人中选择符合颈型颈椎病诊断标准的患者64例，分为金钩钓鱼组和常规针刺组，每组各32例。金钩钓鱼组以颈椎椎体两侧及颈肩部的压痛点为主，采用郑氏"金钩钓鱼"针法刺激浅筋膜治疗；常规针刺组取穴与金钩钓鱼组相同，采用捻转泻法治疗，根据针刺部位选择常规针刺深度。两组患者均每天治疗1次，5天为1个疗程，疗程间间歇2 d，共治疗3个疗程。3个疗程后，观察两组患者McGill疼痛量表(MPQ)及颈椎功能障碍指数量表(NDI)评分情况，比较两组患者的临床疗效。**结果：**治疗后，两组患者MPQ各项评分及NDI评分均较治疗前降低，组内差异具有统计学意义(均$P<0.05$)；金钩钓鱼组MPQ各项评分及NDI评分明显低于常规针刺组，组间差异具有统计学意义(均$P<0.05$)。金钩钓鱼组的总有效率96.9%，治愈率78.1%，优于常规针刺组的81.3%和40.6%，两组差异具有统计学意义(均$P<0.05$)。**结论：**郑氏"金钩钓鱼"针法刺激浅筋膜治疗吉尔吉斯斯坦人颈型颈椎病的疗效优于常规针刺，能够有效改善患者疼痛、僵硬等症状，值得推广。

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【关键词】针刺疗法；颈椎病；颈痛；椎关节僵硬；疼痛测评；吉尔吉斯斯坦人；一带一路倡议
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The neck type cervical spondylopathy, also known as neck-shoulder syndrome, is the most common cervical spondylopathy and also the primary stage of all types of cervical spondylopathy[1], accounting for nearly 40%[2]. The main clinical manifestations include pain in the neck, shoulder and occiput, limited range of motion, and tenderness along the affected area. It mainly occurs in the young and middle-aged people. In modern times, with the popularization of electronic devices, more and more young people are affected. Such disease is featured by shallow lesion site and a quick onset. Acupuncture intervention in an early stage is effective for quick symptom relief and controlling further aggravation. Clinical research has shown that acupuncture treatment is a safe, effective and economical therapy for cervical spondylopathy[3]. However, conventional acupuncture is limited by factors including many acupoints, deep insertion, severe pain and strong needling sensation, for which patients may be afraid of the treatment process. Therefore, it's crucial to find an acupuncture method to alleviate sufferings during treatment. My tutor, the associate professor Qin Xiao-guang has been engaging in the international popularization of traditional Chinese medicine (TCM) culture in the light of the Belt and Road Initiative in recent years. Since 2014, he started to work in Qihuang Acupuncture Center in Kyrgyzstan and train local acupuncture practitioners and TCM fans of conventional acupuncture. He also treated local people with conventional acupuncture and achieved good therapeutic effect. With the consideration of the sensitivity to insertion pain of Kyrgyz and for achieving more significant acupuncture effect, he used Zheng's Jin Gou Diao Yu (gold-hook-fishing) acupuncture method to stimulate superficial fascia for treating neck type cervical spondylopthy, and took conventional acupuncture as the control. The report is now given as follows.

1 Clinical Materials

1.1 Diagnostic criteria

Conforming to the diagnostic criteria of neck type cervical spondylopathy in the *Modern Cervical Spondylosis*[4]. Chief complaints including pain or abnormal feeling in the neck, shoulder and occiput, accompanied by tenderness in the affected areas and neck stiffness; X-ray examination showing the curvature change of cervical vertebrae, dynamic lateral cervical spine imaging showing unsteady and loose intervertebral joint (mild trapezoidal change), and MRI examination showing degeneration of intervertebral disc or posterior disc herniation.

1.2 Inclusion criteria

Conforming to the diagnostic criteria of neck type cervical spondylopathy; aged between 18 and 40 years old with a disease course ranged between 1 month and 2 years; neck disability index (NDI) ranged between 0% and 60%, namely patients with mild, moderate or severe dysfunction of cervical vertebrae; cooperating with the treatment and efficacy evaluation; informed consent.

1.3 Exclusion criteria

Coupled with other types of cervical spondylopathy; neck and shoulder pain caused by congenital malformation of cervical vertebrae, stiff neck, scapulohumeral periarthritis, rheumatic myofibrillitis or other reasons except degeneration of intervertebral disc; with bone fracture, dislocation, acute cervical disc herniation, tuberculosis or infection of cervical vertebrae; with serious diseases of circulation, respiratory or other major systems; women during or preparing for pregnancy, or breast-feeding women; with mental disorders.

1.4 Exclusion and drop-out criteria

Failed to follow the treatment which may affect efficacy evaluation; failed to follow the subsequent visit, cessation of treatment or lost to visit; didn't follow doctors' advice or took other treatment methods; withdrew from the treatment voluntarily.

1.5 Statistical methods

The data processing was done using the SPSS version 20.0 software. The measurement data conforming to normal distribution were described as mean ± standard deviation ($\bar{x} \pm s$). The independent sample *t*-test was used for inter-group comparison, whereas paired sample *t*-test was used for intra-group comparison. Non-parametric test was used for measurement data not conforming to normal distribution. The *Ridit* analysis was used for ranked data. The comparisons of unranked enumeration data were processed by the Chi-square test. $P<0.05$ indicated statistical significance.

1.6 General data

A total of 64 patients visiting Qihuang Acupuncture Centre in Kyrghyzstan between February 2016 and March 2017 were included. This trial had been approved by the Ethics Committee of the Affiliated Hospital of Gansu University of Chinese Medicine. According to their inclusion sequence, the patients were randomized by the random number table into a Jin Gou Diao Yu (gold-hook-fishing) acupuncture group and a conventional acupuncture group, with 32 cases in each group. Patients in the Jin Gou Diao Yu (gold-hook-fishing) acupuncture group were aged between 20 and 40 years with duration of 1-23 months; while patients in the conventional acupuncture group

were aged between 18 and 39 years with duration of 2-24 months. The differences in gender, age, course and severity of disease between the two groups showed no statistical significance (all $P>0.05$), indicating that the two groups were comparable (Table 1).

Table 1. Comparison of the general data

Group	n	Gender (case)		Average age ($\bar{x}\pm s$, year)	Average course ($\bar{x}\pm s$, month)	NDI dysfunction severity (case)			
		Male	Female			Mild	Moderate	Severe	Extremely severe
JGDYAG	32	17	15	29.3±7.5	13.3±4.2	15	12	5	0
Conventional acupuncture	32	14	18	28.1±9.7	12.4±6.0	18	11	3	0

Note: JGDYAG=Jin Gou Diao Yu (gold-hook-fishing) acupuncture group

2 Treatment Methods

2.1 Jin Gou Diao Yu (gold-hook-fishing) acupuncture group

Acupoints: The tender points along the bilateral sides of cervical vertebrae and on the shoulder.

Methods: Filiform needles of 0.25 mm in diameter and 25-40 mm in length were selected. After routine sterilization with 75% alcohol, the practitioner used the left index finger to fix local skin, and inserted the needle with the right hand perpendicularly for 0.5 cun. Then obliquely inserted the needle for 0.5-1.0 cun by a 15-30° angle to wait qi arrival in superficial fascia. Upon qi arrival, applied Jin Gou Diao Yu (gold-hook-fishing) acupuncture method[5], namely twirling the needle body forward for 3-6 times, when feeling heavy and tight, shook the needle tip together with the local tissues for 3-6 times, which looked like a fish swallowing hook. Held the needle to keep the heavy and tight sensation until local muscle was relaxed. Repeated the manipulation for 1 min and retained the needle for 30 min. Finally, withdrew the needle slowly without pressing the hole.

2.2 Conventional acupuncture group

Acupoints: Same as those in the Jin Gou Diao Yu (gold-hook-fishing) acupuncture group.

Methods: Filiform needles of 0.25 mm in diameter and 25-40 mm in length were selected. After routine sterilization with 75% alcohol, inserted the needle for adequate depth according to local anatomical characteristic. During manipulation, fixed local skin tight with the left index finger or thumb, and inserted the needle with the other hand for 1.0-1.5 cun and waited for qi arrival. Applied twirling-reducing manipulation[6], namely a mild and small-range twirling manipulation, with a heavy force when turning right and back, then with a light force when returning. The range of twirling manipulation was between 180° and 360°, at a frequency of 60-90 r/min. Repeated the manipulation for 1 min and retained the needle for 30 min. Finally withdrew the needles slowly without pressing the hole.

Treatment in both groups was done once a day, 5 d as a course, with a 2 d interval between two courses, and the whole treatment lasted for 3 courses.

3 Therapeutic Efficacy Evaluation

3.1 Observation items

3.1.1 McGill pain questionnaire (MPQ)

The MPQ was used for therapeutic evaluation before and after treatment. MPQ included pain rating index (PRI), visual analog scale (VAS) and present pain intensity (PPI).

PRI was classified as a pain sensation score (S) and a pain affection score (A). It was degreed as no pain (0 point), mild pain (1 point), moderate pain (2 points) and severe pain (3 points). The sum of the sub-item scores was the total pain score (T).

VAS score was counted by 10 points. 0 point: 0 cm on the scale which indicated no pain; 1 point: 1-3 cm on the scale which indicated mild pain without influencing normal life and work; 2 points: 4-6 cm on the scale which indicated moderate pain, with influence on work and not affecting normal living; 3 points: 7-10 cm on the scale which indicated severe pain, with influence on work and normal living.

PPI can be classified as no pain (0 point), mild discomfort (1 point), discomfort (2 points), suffering (3 points), terrible pain (4 points), and extreme pain (5 points).

3.1.2 NDI score[7]

NDI score was composed of 10 items which included neck pain and other related symptoms as well as its influence on daily life activities. Score of each item ranged between 0 point and 5 points. Sub-items included pain intensity, personal care, lifting weight, reading, headache, concentration, work, sleep, driving and entertainment. NDI score ranged between 0 point and 50 points, and a higher score indicated a worse cervical function. The total score was counted on the basis of the items finished by the patient, and was used to evaluate the severity of cervical dysfunction.

3.2 Therapeutic efficacy evaluation criteria[4]

3.2.1 Clinical efficacy evaluation

The clinical efficacy was evaluated according to the *Criteria of Diagnosis and Therapeutic Effects of Diseases and Syndromes in Traditional Chinese Medicine*[8].

Cured: Symptoms including neck and shoulder pain,

stiffness and other related signs were gone, and cervical movement was normal.

Marked effect: Obvious improvement in symptoms including neck and shoulder pain, stiffness and other related signs, with basically normal cervical movement.

Effective: Neck and shoulder pain, stiffness and other related signs were partially gone, and cervical movement was better.

Invalid: No improvement in neck pain, stiffness and other abnormal signs.

3.2.2 Analgesic effect

MPQ score was used for therapeutic effect evaluation. Total pain score = PRI score + VAS score + PPI score. Pain improvement index = (Total pain score before treatment − Total pain score after treatment) ÷ Total pain score before treatment × 100%.

Marked effect: Pain improvement index ≥70%.

Effective: Pain improvement index ≥30%, while <70%.

Invalid: Pain improvement index <30%.

3.2.3 Cervical vertebra dysfunction severity

NDI score was used for the evaluation of cervical vertebra dysfunction severity. Cervical vertebra dysfunction index = NDI total score ÷ (Total items finished by patient ×5) × 100%.

Mild dysfunction: Cervical vertebral dysfunction index ≥0, while ≤20%.

Moderate dysfunction: Cervical vertebral dysfunction index >20%, while ≤40%.

Severe dysfunction: Cervical vertebral dysfunction index >40%, while ≤60%.

Extremely severe: Cervical vertebral dysfunction index >60%, while ≤80%.

Total cervical vertebral dysfunction or exaggeration of symptoms: Cervical vertebral dysfunction index >80%, while ≤100%.

3.3 Results

3.3.1 Comparison of the therapeutic efficacy

After treatment, the total effective rate was 96.9% and the cured rate was 78.1% in the Jin Gou Diao Yu (gold-hook-fishing) acupuncture group, which were higher than 81.3% and 40.6% in the conventional acupuncture group, and the differences showed statistical significances (both $P<0.05$), (Table 2).

Table 2. Comparison of clinical efficacy between the two groups (case)

Group	*n*	Cured	Marked effect	Effective	Invalid	Cured rate (%)	Total effective rate (%)
JGDYAG	32	25	4	2	1	78.1	96.9
Conventional acupuncture	32	13	9	4	6	40.6	81.3
x^2-value						9.328	4.010
P-value						0.002	0.045

Note: JGDYAG=Jin Gou Diao Yu (gold-hook-fishing) acupuncture group

3.3.2 Comparisons of MPQ and NDI scores

Before treatment, the comparison of MPQ score between the two groups showed no statistical difference ($P>0.05$), indicating that the two groups were comparable. After treatment, the MPQ scores in both groups dropped, and when compared with the data before treatment, the differences showed statistical significance (both $P<0.05$), indicating that both methods were effective in alleviating neck pain symptoms in neck type cervical spondylopathy patients. After treatment, the MPQ score in the Jin Gou Diao Yu (gold-hook-fishing) acupuncture group was lower than that in the conventional acupuncture group, and the difference showed statistical significance ($P<0.05$), indicating a superior effect in alleviating pain in the Jin Gou Diao Yu (gold-hook-fishing) acupuncture group (Table 3).

After treatment, NDI scores in the two groups dropped significantly when compared with those before treatment, and the difference showed statistical significance (all $P<0.05$), indicating that both methods were effective in improving the dysfunction in neck type cervical spondylopathy patients. After treatment, the between-group comparison of the NDI score showed no statistical significance ($P>0.05$), indicating no obvious difference between the two methods in improving patients' cervical dysfunction (Table 3).

3.3.3 Comparison of analgesic effect after treatment

After treatment, the total effective rate was 96.9% in the Jin Gou Diao Yu (gold-hook-fishing) acupuncture group, higher than 81.3% in the conventional acupuncture group, and the difference showed statistical significance ($P<0.05$), indicating a better analgesic effect in the Jin Gou Diao Yu (gold-hook-fishing) acupuncture group (Table 4).

Table 3. Comparison of MPQ and NDI scores ($\bar{x}$ ±*s*, point)

Group	*n*	Time	MPQ	NDI
JGDYAG	32	BT	11.44±1.26	28.45±8.63
		AT	4.15±2.04[1)2)]	12.86±7.34[1)]
Conventional acupuncture	32	BT	10.35±2.45	26.04±7.57
		AT	5.28±2.67[1)]	13.62±6.19[1)]

Note:JGDYAG=Jin Gou Diao Yu (gold-hook-fishing) acupuncture group; BT=Before treatment; AT=After treatment; intra-group comparison, 1) $P<0.05$; inter-group comparison, 2) $P<0.05$

Table 4. Comparison of analgesic effect after treatment (case)

Group	*n*	Marked effect	Effective	Invalid	Total effective rate (%)
Jin Gou Diao Yu (gold-hook-fishing) acupuncture	32	29	2	1	96.9
Conventional acupuncture	32	19	7	6	81.3
x^2-value					4.010
P-value					0.045

4 Discussion

Neck type cervical spondylopathy belongs to Bi-impediment syndrome in TCM, and is closely linked with muscle regions. It's mainly caused by exogenous pathogenic factors affecting the muscle regions, resulting in muscle spasm, tension, pain, twitching, stiffness and flabbiness in local area[9]. The superficial distribution nature of muscle regions accounts for its easy contraction of external pathogenic factors. When muscle regions around neck and shoulder are affected by external evil and injured, meridians will be blocked and deprived of nutrition, which will then lead to muscle and bone pain and soreness[10]. Modern medicine holds that neck type cervical spondylopathy is caused by long term exhaustion of local muscles and spasm, leading to the imbalance of cervical muscle groups and the altered cervical facet joints stimulating cervical nerve roots, which all give rise to local pain and dysfunction. X-ray examination can reveal the cervical curvature change and narrowed intervertebral space[11-12]. Cervical structure is composed of skin, superficial fascia, deep fascia, muscle, deep vessels and nerves. The subcutaneous tissues under skin are called superficial fascia and the deeper layer is called deep fascia, which are connected with each other and the deep fascia also connects each part of muscles and links with vessels and nerves[13]. Research has shown that puncturing the superficial fascia, via nerve conduction, has the ability to suppress pain center in cortex, and prohibit neurotransmitters from transmitting pain. Then patients' pain threshold will then be lifted and muscle spasm will be released[14].

The Jin Gou Diao Yu (gold-hook-fishing) acupuncture method is invented by Zheng Yu-lin, the founder of the Zheng's academic school of acupuncture in Gansu province. Based on the long-term clinical experience, it's a combination of muscle regions theory with lifting-thrusting method and floating-sinking-like fish swallowing hook theory in *Nei Jing* (*Classic of Internal Medicine*) to treat disorders of muscle regions and joints[15]. Together with Zheng's Er Long Xi Zhu (two dragons playing a ball), Xi Que Deng Mei (magpie climbing plum), Bai She Tu Xin (white snake reaching out its tongue), Guai Mang Fan Shen (python turning over), Jin Ji Zhuo Mi (gold chicken pecking rice), Lao Lü La Mo (old donkey pulling mill) and Shu Zhao Ci Fa (mouse paw acupuncture method), they are commonly called Zheng's eight acupuncture methods[5]. Professor Zheng Kui-shan (also known as the king of acupuncture in north-west China) had arranged and made innovation to these methods which has boosted its popularity at both home and abroad[16]. During Jin Gou Diao Yu (gold-hook-fishing) manipulation, the Mr. Zheng Yu-lin used shallow twisting manipulation and concentrate on the cooperation of both hands and lifting-shaking manipulation to unblock sinews[17]. As a reducing manipulation, Jin Gou Diao Yu (gold-hook-fishing) acupuncture method is generally used for treating diseases including sinew obstruction, closing pattern of stroke, aphasia, scapulohumeral periarthritis, cervical spondylopathy and lumbar disc herniation. It can unblokc meridians and disperse blood stasis, which can finally alleviate pain[18]. According to our preliminary research[19-20], Jin Gou Diao Yu (gold-hook-fishing) acupuncture method can alleviate pain and spasm, and other concomitant symptoms in patients with limb and muscle-joint disorders, and it also has the advantages of convenience, clear sensation conduction, effectiveness and quick action. Since the main symptoms of neck type cervical spondylopathy are local muscle pain, stiffness and movement disorder, with a consideration of the effective reaction of Kyrgyz to acupuncture and their sensitivity to pain, we selected the tender points as acupoints based on the muscle regions theory for point selection. The tender points along bilateral sides of Cervical vertebra and shoulder, namely sinew node points[21] were selected and stimulated by Jin Gou Diao Yu (gold-hook-fishing) acupuncture method on superficial fascia. Such combination of the acupuncture method and acupoint selection principle has two merits. On one hand, it can direct needle sensation to the affected area to dredge channels, alleviate muscle spasm, and thus effectively alleviate neck-shoulder pain and movement disorder in neck type cervical spondylopthy patients. On the other hand, the shallow insertion also reduces pain caused by puncture, which can avoid patients' fear for acupuncture or the aggravation of local muscle spasm. The related research showed that acupuncture tender points can relieve the stimulation to local tissues to stop pain and alleviate spasm[22].

Considering from Kyrgyz patients' characteristics, and based on TCM muscle regions theory, we have combined modern anatomy with Zheng's acupuncture method and achieved a good therapeutic effect. To

conclude, Jin Gou Diao Yu (gold-hook-fishing) acupuncture method stimulating superficial fascia to treat neck type cervical spondylopathy has two merits: the shallow stimulation site, light needle sensation and insertion pain allow more patients to accept this treatment, it is also beneficial to the inheritance and development of traditional acupuncture techniques and the transnational medicine culture exchange and popularization. According to our clinical observation, acupuncture has a good therapeutic effect in Kyrgyz patients. On the one hand, it related to the good awareness of health care of the local people, since their early visit to doctor has prevented a further aggravation of disease; on the other hand, it is linked with the constitution of the local people. Kyrgyzstan takes agriculture and husbandry as its pillar industry and local ecological environment is in a good protection, and the green food is the main supply, which may be associated with the local people's good health and their sensitivity to acupuncture stimulation. The differences in therapeutic effect among different regions and nations, and the influencing factor still require further discussion and investigation in the long run.

Conflict of Interest

There was no potential conflict of interest in this article.

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Statement of Informed Consent

Informed consent was obtained from the patients in this study.

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