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Clinical Study

Clinical observation of *Shu*-acupuncture method in *Nei Jing* (*Classic of Internal Medicine*) for shoulder and arm pain

《内经》输刺法治疗肩臂痛临床观察

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Abstract
Objective: To observe the clinical effects of *Shu*-acupuncture method in *Nei Jing* (*Classic of Internal Medicine*) in the treatment of shoulder and arm pain.
Methods: A total of 90 patients with shoulder and arm pain were randomly divided into an observation group and a control group, 45 cases in each group. The treatment of *Shu*-acupuncture method in *Nei Jing* (*Classic of Internal Medicine*) was adopted in the observation group, routine acupuncture was used in the control group. The two groups were treated once every day, with 5 treatments as one course, and a 2-day rest between two courses. After 3 courses, pain was assessed by visual analog scale (VAS), and the clinical effects were compared between the two groups.
Results: After the treatment, VAS scores were significantly changed in both groups (both $P<0.01$). The VAS score was lower in the observation group than that in the control group, with a statistical difference between the two groups ($P<0.05$). The total effective rate was 100% in the observation group, versus 91.1% in the control group, the difference was statistically significant ($P<0.05$).
Conclusion: The therapeutic effect of *Shu*-acupuncture method in *Nei Jing* (*Classic of Internal Medicine*) is better than that of routine acupuncture in treating shoulder and arm pain.
Keywords: Acupuncture Therapy; *Shu*-acupuncture Method; *Nei Jing* (*Classic of Internal Medicine*); Shoulder Pain; Visual Analog Scale; Pain Measurement

【摘要】目的：观察《内经》输刺法为主治疗肩臂痛的临床疗效。**方法：**将90例肩臂痛患者随机分为观察组和对照组，每组45例。观察组采用《内经》输刺法治疗，对照组采用常规针刺治疗。两组均每日治疗1次，5次为1疗程，疗程间休息2 d。治疗3个疗程后进行疼痛的视觉模拟量表(VAS)评分，并比较两组的临床疗效。**结果：**治疗后，两组VAS评分均与本组治疗前有统计学差异(均$P<0.01$)；观察组VAS评分低于对照组，组间差异有统计学意义($P<0.05$)。观察组总有效率为100.0%，对照组为91.1%，两组总有效率差异具有统计学意义($P<0.05$)。**结论：**《内经》输刺法治疗肩臂痛疗效优于常规针刺。

【关键词】针刺疗法；输刺法；《内经》；肩痛；视觉模拟量表；疼痛测评
【中图分类号】R244.1　　**【文献标志码】**A

Shoulder and arm pain is a common disorder involving the muscles and joints. It mainly causes pain in the arm and shoulder joints, coupled with a sensation of soreness, heaviness or numbness. Although multiple factors may cause shoulder/arm pain, the most common causes are chronic neck/shoulder muscle strain or soft tissue problems[1]. Today, shoulder and arm pain is being seen in younger people who spent too much time using electronic devices. Clinical studies have proven that acupuncture has a remarkable effect, fewer side effects and lower cost for shoulder and arm pain[2-3]. Since conventional acupuncture often has a shallow insertion, produces a mild needling sensation and requires a long treatment course, the authors of this paper treated 45 cases with the classical *Shu*-acupuncture method and compared with the efficacy obtained by the conventional acupuncture. The results are now summarized as follows.

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1 Clinical Materials

1.1 Diagnostic criteria

In reference to the diagnostic criteria for cervical spondylopathy and shoulder joint problems in *Criteria of Diagnosis and Therapeutic Effect of Diseases and Syndromes in Traditional Chinese Medicine*, the diagnostic criteria in this study were self designed[4]: pain in the neck and shoulder, with uncomfortable stiffness and difficult motion; history of long-term strain in the neck and shoulder, repeated history of neck pain, history of soft tissue injury, history of shoulder joint problem or cervical spondylopathy, abnormal X-ray results; sore and stuck sensation in the shoulder and arm, possibly accompanied by numbness in the fingers and radiating pain. The diagnosis was made based upon the presence of previous 2 items, or items 2 and 3, or items 1 and 2, or previous 3 items.

1.2 Inclusion criteria

In conformity with the above diagnostic criteria; with the age ranging between 20 and 60 years old, and duration from 1-36 months; willing to accept the clinical observation and having signed the informed consent.

1.3 Exclusion criteria

Not in conformity with the above diagnostic criteria; patients with shoulder and arm pain not only caused by cervical and soft tissue problems; patients with diseases of other systems (such as heart diseases, hepatitis) and on long-term administration of medications; pregnant women; patients with mental disorders.

1.4 Rejecting criteria

Those unable to tolerate the treatment or the treatment continued less than 2 courses; unable to follow the doctor's advice, on medications or other therapies during the treatment; those dropped out voluntarily and unable to receive the observation of the therapeutic effects.

1.5 Statistical analysis

The SPSS 20.0 version statistical software was used for statistical analysis. The measurement data were first processed by the normality test. The measurement data in conformity with the normal distribution were expressed by mean ± standard deviation ($\bar{x} \pm s$). The comparison between the groups was processed by the two independent sample *t*-test. The comparison within the group was processed by paired *t*-test. The measurement data not in conformity with the normal distribution were processed by non-parametric test. The grading data were processed by *Ridit* analysis. The comparison of the rates was processed by Chi-square test. $P<0.05$ indicated a statistical difference.

1.6 General data

A total of 90 patients recruited in this study came from the Outpatient of Acupuncture Center of Gansu University of Chinese Medicine between November 2014 and June 2016. Based upon the order of their visit, the patients were divided by the random digital table into an observation group and a control group, 45 cases in each group. In the observation group, the age ranged from 20 to 57 years old and the duration ranged from 1 month to 34 months. In the control group, the age ranged from 22 to 60 years old and the duration ranged from 2 months to 36 months. In comparison of the general data of the gender, age and duration between the two groups, the differences were not statistically significant (all $P>0.05$), indicating that the two groups were comparable (Table 1).

Table 1. Comparison of general data between the two groups

Group	*n*	Gender (case)		Average age ($\bar{x} \pm s$, year)	Average duration ($\bar{x} \pm s$, month)
		Male	Female		
Observation	45	14	31	40.3±10.0	19.7±10.2
Control	45	21	24	40.1±12.3	20.8±10.3

2 Treatment Methods

2.1 Observation group

Major points: Jianyu (LI 15), Jianliao (TE 14), Jianzhen (SI 9), Jianqian (Extra), Yanglingquan (GB 34) and Ashi point.

Adjunct points: Houxi (SI 3) and Shenmai (BL 62) were added for neck pain; Quchi (LI 11) and Hegu (LI 4) were added for serious pain in the upper limb.

Method: After the patient took a sitting position and routine disinfection of the points, filiform needles of 0.30 mm in diameter and 50 mm in length were selected. By *Shu*-acupuncture method, the needles were inserted perpendicularly in the major points, for about 2 cun with the needle tip reaching the surface of the bone. After the arrival of the needling sensation, the needles were slightly twisted till a sinking and tight sensation appeared. The adjunct points were managed by routine needling method[5], with the needles retained for 30 min. After the treatment, the patients were asked to exercise the neck, shoulder and upper limb.

2.2 Control group

Points: Same as the observation group.

Method: After the patient took a sitting position and routine disinfection of the points, filiform needles of 0.30 mm in diameter and 50 mm in length were selected. By pressing skin of the point with the index finger or thumb of the left hand, the needles were inserted by the right hand into the points for about 1.0-1.5 cun. After arrival of the needling sensation, the needles were twisted by an angle of 180-360° and at a frequency of 60-90 r/min[5], repeatedly for 1 min, and then retained for 30 min. After the treatment, the patients were asked to move the neck, shoulder and upper limb.

The two groups were treated once every day, with 5 treatments as one course, and a 2-day rest between two courses, for 3 courses in total.

3 Observation on Therapeutic Effects

3.1 Observed items

Respectively before and after the treatment, pain was assessed by visual analog scale (VAS)[6]: a cardboard scale of 10 cm in length, the left side marked 0 cm, expressing no pain, scored 0 point; the right side marked 10 cm, expressing intolerable serious pain, scored 10 points. The patients were asked to score based upon the pain degree.

3.2 Criteria of therapeutic effects

Cure: Pain disappeared, with VAS scored 0, and the patient can have normal life and work.

Remarkably effective: Pain basically disappeared, or VAS score decreased by ≥ 3 cm.

Effective: Pain was somewhat alleviated, or VAS score decreased by ≥ 1 cm, but < 3 cm.

Failure: Pain did not disappear, or VAS score decreased by < 1 cm.

3.3 Results

3.3.1 Comparison of VAS score

The difference in VAS score between the two groups before the treatment was not statistically significant (P>0.05), indicating that the two groups were comparable. After the treatment, VAS scores decreased in both groups, and the intra-group differences were statistically significant (P<0.01, P<0.05), indicating that both protocols can alleviate pain. After the treatment, VAS score of the observation group was obviously lower than that of the control group, with a statistical inter-group difference (P<0.05), indicating that *Shu*-acupuncture method is better than the routine needling method for shoulder and arm pain (Table 2).

3.3.2 Comparison of clinical effect

After the treatment, the total effective rate was 100% in the observation group, higher than 91.1% in the control group (χ^2=4.186, P=0.041), and the curative rate was 93.3% in the observation group, higher than 24.4% in the control group (χ^2=25.613, P=0.000), indicating that the therapeutic effect in the observation group was better than that in the control group (Table 3).

Table 2. Comparisons of VAS scores before and after the treatment ($\bar{x}$ ±s, point)

Group	n	Before treatment	After treatment	t-value	P-value
Observation	45	5.00±2.61	2.23±1.87	9.935	0.000
Control	45	6.04±2.66	3.62±2.53	11.178	0.000
t-value		−1.879	−1.327		
P-value		0.064	0.021		

Table 3. Comparison of clinical effect between the two groups (case)

Group	n	Cure	Remarkably effective	Effective	Failure	Curative rate (%)	Total effective rate (%)
Observation	45	35	7	3	0	93.3[1)]	100.0[1)]
Control	45	11	19	11	4	24.4	91.1

Note: Compared with the control group, 1) P<0.05

4 Discussion

Today, the shoulder and arm pain is mainly treated by topical herbal application, injection or acupuncture. All these therapies help to relieve pain to some degree[2-3, 7-8]. However, conventional acupuncture has a shallow insertion and cannot relieve the pain in the shoulder and arm, which often involves the bones and sinews. The *Shu*-acupuncture method, one of the five classical needling techniques recorded in the *Huang Di Nei Jing* (*Yellow Emperor's Classic of Internal Medicine*) is mainly indicated for bone pain, limb numbness/pain/paralysis or hemiplegia[9]. Consequently, this study aims to observe its efficacy for shoulder and arm pain.

In Chinese medicine, the pain, numbness and impaired movement of the shoulder and arm result from chronic strain and retention of wind, cold and dampness in the joints, muscles or sinews. According to the *Huang Di Nei Jing* (*Yellow Emperor's Classic of Internal Medicine*), pain most commonly occurs when wind, cold and dampness obstructs the flow of qi and blood[10]. The shoulder and arm pain occurs when cold dampness obstructs the flow of meridian qi and causes local muscle spasm.

In modern medicine, the shoulder and arm pain is commonly caused by degeneration of the shoulder joint, cervical vertebrae and humerus. Some patients may have soft tissue problems[11]. This study mainly focuses on bone degeneration. Individuals included in the study have long sedentary work hours or a history of local muscle strain and/or exposure to cold. The pain often has no fixed positions. Despite the intense pain in some patients, they have normal range of joint motion and

normal radiological findings[1]. As a result, the treatment strategy is mainly to relieve local pain. Studies have found that acupuncture can speed up the local tissue metabolism and circulate qi and blood[12], reduce the skin electrical resistance, increase the skin conductivity, improve the local circulation, and thus alleviate pain[13].

'*Shu*', in *Shu*-acupuncture method of the five classic needling techniques, means to discharge pathogenic cold and dampness from the muscles and bone joints[14]. In the operation, the perpendicular puncture, deep to the bone, plus manipulation of the needles by the lifting, thrusting, twisting and rotating techniques in small amplitude, is supposed to soothe the tendons, dredge the collaterals, circulate qi, activate blood, strengthen the tendons and stop pain. The importance in its operation is the perpendicular insertion and perpendicular withdrawal of the needles, deep to the bone area of the points. On one hand, the perpendicular insertion of the needle can promote the needling sensation directly to the diseased area, for effectively exciting the meridian qi in the deep region. On the other hand, the perpendicular withdrawal of the needle can guide the pathogenic factor of the deep region to come out, so as to dredge the meridians and collaterals, dispel the pathogens and stop pain. Additionally, in terms of five Zang organs, the kidney dominates bone and produces marrow. Bone and marrow are the deep tissues of the human body[15]. Shoulder and arm pain in the patients is mostly caused by the accumulation of pathogenic cold and dampness in the bone, and tendons and muscles of the deep region, deeper in the pathologic position. Therefore, only by deep puncture, can it be possible to excite the meridian qi of the human body, guide the meridian qi of the whole body to flow upward and discharge the pathogens[16]. In accordance with the sayings of 'where the meridian goes through, where can be treated', the points are selected by the combination of the local points and remote points, local points in predominance, in order to dredge the local meridians and collaterals, circulate qi and activate blood, plus the remote points to dredge the meridian qi and ensure the smooth circulation of the meridian qi[17]. Yanglingquan (GB 34), the influential acupoint of tendons in the Eight Influential Points, is able to soothe the tendons, activate the collaterals and stop pain. Houxi (SI 3) and Shenmai (BL 62) are the intersecting points of the eight meridians. Houxi (SI 3) links with the Governor Vessel and the Governor Vessel governs yang qi of the whole body. Shenmai (BL 62) links with the Yang Heel Vessel, and the Yang Heel Vessel dominates the activity of the limbs of the human body. The combination of those two points can dredge qi and blood in the neck and shoulder, and regulate the circulation of local qi and blood. Quchi (LI 11) and Hegu (LI 4) are respectively He-sea point and Yuan-Primary point of the Large Intestine Meridian of Hand Yangming. Two points in combination can dredge the meridians of the upper limbs and promote the circulation of the meridian qi of the upper limbs[18]. Such a combination of the needling technique and points can ensure 'problem eliminated while the needles are punctured'. Therefore, the satisfactory therapeutic effects can be achieved. Now, there are many clinical reports on application of *Shu*-acupuncture method. For instance, the better therapeutic effects are achieved in the treatment of the diseases, such as heel pain, numbness and pain of the lower limbs by lumbar disc herniation, knee osteoarthritis, by *Shu*-acupuncture method[19-21], proving that the therapeutic effects are satisfactory in the treatment of bone Bi-impediment syndrome and pain and numbness of the limb by *Shu*-acupuncture method.

It has been found that *Shu*-acupuncture method in acupuncture treatment of shoulder and arm pain in predominance is strong in the needling sensation, obvious in propagation, fast in the therapeutic action, and short in the course, and can avoid the disadvantages of shallow needling stimulation, weak needling sensation, unobvious propagation, failure to reach the diseased area and long course in routine acupuncture. Therefore, it is worthy of clinical popularization.

Conflict of Interest

The authors declared that there was no potential conflict of interest in this article.

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Statement of Informed Consent

Informed consent was obtained from all individual participants in this study.

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