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CLINICAL RESEARCH

Clinical Study of "Three Steps-seven Methods of Tuina" Combined with Warm Acupuncture in the Treatment of Patients with Lumbar Disc Herniation

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Key words

Three steps-seven methods of Tuina, Warm acupuncture, Lumbar disc herniation, Nerve conduction velocity, Inflammatory factors

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Abstract

Objective To explore the clinical effect of three-step and seven-method of Tuina combined with warm acupuncture in the treatment of patients with lumbar disc herniation. **Methods** 118 LDH patients who were treated in our hospital from March 2019 to January 2022 were randomly divided into a control group and an observation group, with 59 cases in each group. Patients in the control group were treated with warm acupuncture, and those in the observation group were treated with three-step and seven-method of Tuina on the basis of the control group. Clinical efficacy, nerve conduction velocity, inflammatory factors and visual analogue scale (VAS) scores, FairbankJC low back pain scores, and Japanese orthopaedic association (JOA) scores were compared between the two groups. **Results** The total effective rate of the observation group was significantly higher than that of the control group (P<0.05). After treatment, the nerve conduction velocities of the tibial nerve and the common peroneal nerve in the two groups were evidently higher than those before treatment (P<0.05), and those of the observation group were obviously higher than those of the control group (P<0.05). After treatment, the levels of tumor necrosis factor-α (TNF-α), interleukin-1 (IL-1), interleukin-6 (IL-6) and VAS, FairbankJC, and JOA were significantly lower than those before treatment (P<0.05), and those of the observation group were markedly lower than those of the control group (P<0.05). **Conclusion** "Three-step and seven-method of Tuina" combined with warm acupuncture can effectively alleviate the clinical symptoms of LDH patients, help improve the speed of nerve conduction, reduce the body's inflammatory response, relieve pain, and enhance lumbar spine function.

Introduction

Lumbar disc herniation (LDH) is a common disease in clinical orthopaedics. The clinical manifestations of LDH patients include lumbar and leg pain and neurological dysfunction. The disease has a long course and is easy to recur, which has a serious impact on the daily life of patients[1]. Currently, conservative treatment is the preferred treatment for LDH. Acupuncture, moxibustion, massage and other traditional Chinese medicine treatments have good effects in the treatment of LDH, and have its advantages such as less side effects, less trauma and high patient acceptance, which are widely used clinically[2]. Warm acupuncture and moxibustion is a commonly used external treatment in traditional Chinese medicine. It transmits heat into the body through filiform needles, stimulates local acupoints to promote Qi and activate blood circulation, relieve pain and remove blood stasis, which can treat the stagnation of meridians and collaterals as well as arthralgia. Warm acupuncture combined with massage can improve the lumbar function and reduce pain in patients with LDH, which has high use value[3~4]. On the basis of the overall theory of viscera and meridians, the three-step and seven-method of Tuina is induced by the massage department of rehabilitation hospital affiliated to Fujian University of Traditional Chinese Medicine. The method can treat shoulder, waist and leg pain by regulating the Du impulse and tonifying the viscera with valid clinical effect. At present, there is no research on warm acupuncture combined with three-step and seven-method of Tuina in patients with LDH. The purpose of this study is to explore the clinical efficacy of warm acupuncture combined with three-step and seven-method of Tuina in patients with LDH and provide reference for clinical treatment. The research results are reported as follows.

Materials and methods

General information

118 LDH patients who were treated in our hospital from March 2019 to January 2022 were selected and randomly divided into an observation group (n=59) and a control group (n=59). There was no significant difference in gender, age, course and the location of lesion between the two groups (P>0.05), as presented in Table 1. This study was approved by Medical Ethics Committee, and patients were informed and agreed.

Table 1 Comparison of general information between the two groups

Groups	Number of cases	Gender (cases)		Age (years old)	Course (months)	Location of lesion (cases)		
		Male	Female			L_4~L_5	L_5~S_1	L_4~L_5 and L_5~S_1
Observation group	59	33	26	49.17±7.24	9.56±1.38	18	22	19
Control group	59	31	28	49.98±7.08	9.67±1.19	17	21	21
χ^2/t		0.137		-0.614	-0.464	0.152		
P		0.712		0.540	0.644	0.927		

Inclusion criteria

(1) Patients' symptoms meet the diagnostic criteria of LDH from an Evidence-based Clinical Guideline for the Diagnosis and Treatment of Lumbar Disc Herniation with Radiculopathy[5] and Criteria of Diagnosis and Therapeutic Effect of Diseases and Syndromes in Traditional Chinese Medicine[6]; (2) Patients are diagnosed with LDH by imaging examination, such as X-ray and magnetic resonance imaging (MRI); (3) Patients with complete clinical data, no indications for surgery, and good compliance.

Exclusion criteria

(1) Patients with cognitive, coagulating, immune and neurological dysfunction; (2) Patients with organic lesion of lumbar vertebra such as lumbar vertebra tuberculosis, lumbar spinal stenosis, fracture, and spinal canal tumor; (3) Patients with malignant tumor,

serious infection, damage of organs such as heart, liver and kidney; (4) Pregnant or menstruating women.

Treatment methods

Control group

Patients in the control group were treated with warm acupuncture and moxibustion. Acupoints, including Shenshu (BL23), Huantiao (GB30), Zusanli (ST36), Yanglingquan (GB34), Xuanzhong (G39) and waist Ashi, were selected for acupuncture. After the arrival of Qi, the needle was retained, and moxa was fixed on the needle handle and ignited, 30 min each time, once a day, five times a week for 3 weeks in total.

Observation group

Patients in the observation group were treated with three-step and seven-method of Tuina on the basis of the control group, 30 min each time, once a day, 6 times a week for a total of 3 weeks. (1) Step 1: Recuperate liver, spleen and kidney, and regulate muscles, bones and flesh, including method of dredging liver, spleen and kidney meridians and method of recuperating liver, spleen and kidney. Firstly, the liver meridian from Dadun (LR1) to Zhongfeng (LR4), the spleen meridian from Yinbai (SP1) to Yinlingquan (GB34), and the kidney meridian from Rangu (KI2) to Fuliu (KI7) were pressed along the meridians for 30 times per meridian, and the criteria were local sensation of soreness and fever in patients; Then, Ganshu (BL18), Pishu (BL20) and Shenshu (BL23) were tapped successively with one hand, and Qimen (LR14), Zhangmen (LR13) and Jingmen (G25) were pressed successively with the palm of the other hand for 1min/point. It is better when the patient had fever and conduction; (2) Step 2: Regulate the Du impulse and invigorate yang Qi, including the methods of regulating the Du impulse, dredging the waist and leg meridians, and tapping the lumbosacral region. First, the patient was in the prone position, and the doctor points the Fengfu (GV16), Dazhui (GV14), Zhiyang (CV9), Mingmen (GV4) and Yaoyangguan (DU3) with his thumb for 1 min/point to the point that patient took local fever and conduction. Secondly, the patient's urinary bladder meridians, Du impulse and paravertebral region were tapped, finger-rubbed and plucked 3-5 times along the meridian. Then the lumbosacral region were beaten with palm gently for 3~5min to the point of diathermy; (3) Step 3: Reduction manipulations and joint lubricating, including lumbar spinal multiple intermittent stretching and hip and knee joints stretching. First, the patient took the supine position, two assistants fixed his shoulder and ankle, and forced him to stay in the stretching state for 30 s. At the same time, the doctor swung his iliac spines of the anterior approach of the hip joint about with an angel of 15° from side to side when the patient was in the stretching state, and takes an intermittent rest for 30 s, and it was repeated for 7 times; Then the patient's lower limbs and pelvis were fixed, the lower limbs were lifted until the patient felt the tension in the lower limbs, and it was repeated for 7 times.

Observation indexes

(1) Clinical efficacy[7]: Before and 3 weeks after treatment, the lumbar and leg pain in the two groups were observed to evaluate the clinical efficacy. Cured: no pain; Markedly effective: less pain; Effective: the pain is obvious but does not affect daily life; Ineffective: no improvement in lumbar and leg pain with obvious limitation in daily life. Total effective rate = (cure rate + markedly effective rate + effective rate) cases/total cases × 100%; (2) Nerve conduction velocity: Before and 3 weeks after treatment, the conduction velocities of tibial nerve and common peroneal nerve were measured by an electromyogram evoked potential instrument (Nicolet, Nicolet EDX, national accession number of import machine: GXZJ20172210596); (3) Inflammatory factors: 5 ml fasting venous blood of the two groups was collected in the morning before and 3 weeks after treatment and submitted for censorship, and the levels of tumor necrosis factor-α (TNF-α), interleukin-1 (IL-1) and interleukin-6 (IL-6) in the serum were detected by enzyme-linked immunosorbent assay (ELISA, Ek-Bioscience); (4) Visual analogue scale (VAS) scores[8], FairbankJC low back pain scores[9], and

Japanese orthopaedic association (JOA) scores[10]: Before and 3 weeks after treatment, VAS score was used to evaluate the degree of pain. The higher the score, the stronger the pain. At the same time, the clinical symptoms and life quality of patients in the two groups were evaluated by FairbankJC low back pain score and JOA score. The higher the FairbankJC score, the more serious the symptoms and the lower the quality of life. The higher the JOA score, the more serious the dysfunction of daily life.

Statistical methods

Statistical analysis was conducted using SPSS 20.0, and the enumeration data were compared using χ^2 test. The measurement data were presented in mean ± standard deviation（$\bar{x}\pm s$）. Comparison between two groups was done with independent sample *t*-test. Comparison among different time points in the same group was performed using the paired sample *t*-test. $P<0.05$ was considered to be statistically significant.

Results

Comparison of clinical efficacy between the two groups

The total effective rate of the observation group was significantly higher than that of the control group ($P<0.05$), as shown in Table 2.

Table 2 Comparison of clinical efficacy between the two groups [cases (%)]

Groups	Number of cases	Cured	Markedly effective	Effective	Ineffective	Total effective rate
Observation group	59	16 (27.12)	25 (42.37)	14 (23.73)	4 (6.78)	55 (93.22)
Control group	59	8 (13.56)	19 (32.20)	17 (28.82)	15 (25.42)	44 (74.58)
χ^2						7.591
P						0.006

Comparison of nerve conduction velocity between the two groups before and after treatment

Before treatment, there was no significant difference in the conduction velocity of tibial nerve and common peroneal nerve between the two groups ($P>0.05$). After treatment, the conduction velocity of tibial nerve and common peroneal nerve in the two groups was evidently higher than that before treatment ($P<0.05$), and the conduction velocity in the observation group was distinctly higher than that in the control group ($P<0.05$), as exhibited in Table 3

Comparison of inflammatory factors between the two groups before and after treatment

Prior to treatment, difference in the levels of TNF-α, IL-1 and IL-6 between the two groups was not significant ($P>0.05$). After treatment, evidently lower levels of TNF-α, IL-1 and IL-6 in both groups were presented compared with before treatment ($P<0.05$), and these levels in the observation group were markedly lower than those in the control group ($P<0.05$). as presented in Table 4.

Comparison of scores of all scales between the two groups before and after treatment

Before treatment, there was no significant difference in VAS, FairbankJC and JOA scores between the two groups ($P>0.05$); however, after treatment, the scores of VAS, FairbankJC and JOA in the two groups were obviously lower than those before treatment ($P<0.05$), and these scores in the observation group were markedly lower than those in the control group ($P<0.05$), as shown in Table 5.

Table 3 Comparison of nerve conduction velocity between the two groups before and after treatment ($\bar{x}$±s, m/s)

Groups	Number of cases	Tibial nerve		Common peroneal nerve	
		Before treatment	After treatment	Before treatment	After treatment
Observation group	59	39.66±1.19	46.24±4.25*	38.21±3.75	47.75±5.15*
Control group	59	39.48±1.28	42.39±4.67*	38.19±3.34	41.10±4.12*
t		0.791	4.683	0.031	7.745
P		0.431	0.000	0.976	0.000

Note: compared with before treatment: *P<0.05

Table 4 Comparison of inflammatory factors between the two groups before and after treatment ($\bar{x}$±s)

Groups	Number of cases	TNF-α (μg/mL)		IL-1 (pg/mL)		IL-6 (μg/L)	
		Before treatment	After treatment	Before treatment	After treatment	Before treatment	After treatment
Observation group	59	1.91±0.33	1.05±0.29*	79.08±11.78	25.80±3.97*	141.93±11.23	117.96±9.65*
Control group	59	1.92±0.25	1.46±0.43*	78.95±12.25	36.68±5.62*	142.51±12.99	129.64±10.64*
t		-0.186	-6.072	0.050	-12.146	-0.259	-6.246
P		0.853	0.000	0.960	0.000	0.796	0.000

Note: compared with before treatment: *P<0.05

Table 5 Comparison of scores of all scales between the two groups before and after treatment ($\bar{x}$±s, points)

Groups	Number of cases	VAS scores		FairbankJC scores		JOA scores	
		Before treatment	After treatment	Before treatment	After treatment	Before treatment	After treatment
Observation group	59	5.84±0.97	1.93±0.80*	61.42±7.06	31.83±4.97*	61.54±6.86	29.34±6.03*
Control group	59	5.91±1.30	3.58±0.98*	61.13±7.01	42.99±5.82*	61.44±7.02	43.58±6.22*
t		-0.331	-10.018	0.224	-11.201	0.089	-12.626
P		0.741	0.000	0.823	0.000	0.929	0.000

Note: compared with before treatment: *P<0.05

Discussion

LDH refers to the protrusion or prolapse of the nucleus pulposus after the disruption of lumbar annulus fibrosus, which stimulates the nerve roots of the adjacent intraspinal spur, and then leads to symptoms such as waist and leg pain and numbness. In traditional Chinese medicine, LDH is classified as "rheumatism" and "collateral disease". It is recorded in General Treatise on the Cause and Symptoms of Diseases that " Insufficient Qi in kidney is caused by wind-evil; Overexertion results in kidney deficiency which then contributes to susceptibility to cold wind, and the conflict between wind chill and vital Qi leads to waist and leg pain.", It can be seen that LDH is caused by the joint action of many factors. "The waist is the house of the kidney". The internal cause of the

disease is liver and kidney deficiency and lack of essence, which results in insufficient norishment of lumbar spine muscles and bones over time. The external causes are mostly falling injury or strain, which leads to blood stasis, and causes obstruction of the meridians and collaterals with wind-cold-wetness evil invading the body as obstruction leads to pain. At present, the conservative treatment of LDH is mainly traditional Chinese medicine therapy, such as massage, Chinese herb fumigation, acupuncture and moxibustion[11]. Warm acupuncture refers to moxibustion on the needle handle after acupuncture, which can remove arthralgia, relieve pain and warm and nourish meridians. Massage is to apply such techniques as rubbing, kneading and massaging on the meridians and acupoints, which can relax tendons and activate blood circulation, soften hardness and dissolve lump[12]. Three-step and seven-method of Tuina is a set of massage techniques based on the theory of meridians and viscera in traditional Chinese medicine. It can regulate the liver, spleen and kidney, build up healthful vital energy and regulate the foundation of human disease resistance. The purpose of this study is to explore the clinical effect of three-step and seven-method of Tuina combined with warm acupuncture on patients with LDH and its effect on the level of inflammatory factors. The results suggested that the combined treatment had a good effect.

The protruded nucleus pulposus in patients with LDH oppresses the nerve root, resulting in damage or loss of myelin sheath of tibial nerve and common peroneal nerve, which reduces the conduction velocity of motor nerve and sensory nerve in varying degrees, and the decrease is positively correlated with the condition of LDH. Our results showed that the total effective rate of the observation group was significantly higher than that of the control group. After treatment, the conduction velocity of tibial nerve and common peroneal nerve in the two groups was evidently higher than that before treatment, and the velocity in the observation group was distinctly higher than that in the control group. After treatment, VAS, FairbankJC and JOA scores of the two groups were markedly lower than those before treatment, and the scores of the observation group were significantly lower than those of the control group. It is thus suggested that three-step and seven-method of Tuina combined with warm acupuncture can effectively alleviate the clinical symptoms of patients with LDH, improve the nerve conduction velocity and reduce pain. Warm acupuncture have the effects of acupuncture, moxibustion and moxa. In this study, the acupuncture points Shenshu (BL23), Huantiao (GB30), Zusanli (ST36), Yanglingquan (GB34), Xuanzhong (G39), waist Ashi and other acupoints were selected, which can promote blood circulation, remove blood stasis, dispel wind and alleviate pain. Modern research[13~14] shows that Shenshu (BL23) is adjacent to bone fibrous canal and other structures, while bone fibrous canal is similar to waist muscle groups, which is closely related to the movement of the waist and lower limbs of the human body. Warm acupuncture and moxibustion can improve local temperature, promote blood circulation to alleviate the local ischemia and hypoxia of peripheral nerve and muscle tissue, promote the recovery of nerve function, and alleviate muscle spasm; In addition, warm acupuncture can promote the release of endogenous opioid peptides, inhibit the release of pain transmitters, block conduction tract of pain perception, and thus play an analgesic effect. According to the overall concept of traditional Chinese medicine, the meridians send blood and Qi to the whole body and connect with the viscera. The acupoints are the intersection of the meridians. Massaging along the meridians and pressing the acupoints can clear the tendons and blood and regulate the viscera. It has been emphasized that "Diseases can be cured wherever the meridians pass". The three-step and seven-method of Tuina acts on the liver, spleen and kidney meridians, promoting blood and Qi circulation, dispersing knots and dredging collaterals. At the same time, the three-step and seven-method of Tuina can help straighten the spine, promote the protruding nucleus pulposus to return to its original position, and reduce the pressure of the nucleus pulposus on the nerve roots. In addition, three-step and seven-method of Tuina can relax the

muscles, reduce the spasm of peripheral muscles, increase the strength and activity of lumbar muscles, and then relieve the clinical symptoms of LDH and pain.

Studies[8] have reported that LDH will stimulate the body to release prostaglandins, TNF-α, IL and other inflammatory mediators, then promote the inflammatory reaction, increase the tissue damage of the lumbar intervertebral disc, which further aggravates both symptoms of congestion and edema of the lumbar intervertebral disc, and increases pain. The results of this study presented that after treatment, the levels of TNF-α, IL-1 and IL-6 in the observation group were significantly lower than those in the control group. It is suggested that three-step and seven-method of Tuina combined with warm acupuncture is helpful to reduce the body's inflammatory response. Presumably this is because warm acupuncture combined with three-step and seven-method of Tuina can act on the Du impulse and blood essence, synergistically improve the local blood and lymph circulation of patients, reduce edema, promote the metabolism of inflammatory mediators, and thus alleviate LDH symptoms[13]. Chen et al.[15] used warm acupuncture combined with three-step and seven-method of Tuina to treat low back pain of yang deficiency and cold-dampness blockage. Accordingly, it was demonstrated that the combined treatment can inhibit the body's inflammatory response, with significant curative effect, which is consistent with the results of this study.

To sum up, the three-step and seven-method of Tuina combined with warm acupuncture can effectively alleviate the clinical symptoms of LDH patients, improve the nerve conduction velocity, reduce body's inflammatory reaction, reduce pain and enhance the lumbar function.

Declaration of conflict-of-interest

The authors declare no conflict-of-interest.

References

[1] Zhou X,Fang Q,Gu M,et al.Effect of Duhuo Jisheng Decoction combined with large area moxibustion on analgesic effect and quality of life of cold-damp type lumbar disc herniation[J].Chinese Journal of General Practice,2021,19(02):298-301.

[2] Wang Y,Ning Y,Ding Y,et al. Research Progress of TCM Non-Surgical Therapy in Treating LDH[J].Information on Traditional Chinese Medicine,2022,39(1):80-83.

[3] Li J,Qi Y.Study on Lumbar Muscle Function and Curative Effects of Manipulation in Combination with Acupunctureon the Blood Stasis Type Lumbar Intervertebral Disc Protrusion[J].World Chinese Medicine,2020,15(6):920-921.

[4] Su Y,Zhu J,Ma X. Curative Effect and Safety of Needle-Warming Moxibustion on Jiaji Acupoints in Treating LDH[J].Journal of Clinical Acupuncture and Moxibustion,2021,37(1):44-47.

[5] Kreiner DS, Hwang SW, Easa JE, et al . An evidence-based clinical guideline for the diagnosis and treatment of lumbar disc herniation with radiculopathy[J].Spine J,2014,14(1):180-191.

[6] State Administration of Traditional Chinese Medicine.Criteria of Diagnosis and Therapeutic Effect of Diseases and Syndromes in Traditional Chinese Medicine[S].Nanjing: Nanjing University Press,1994:214.

[7] Liu X.Effect of Warm Acupuncture Combined with Acupoint Selection and Massage along the Meridian on Pain Degree and Serum Inflammatory Factors in Patients with Lumbar Disc Herniation[J].Journal of Sichuan Traditional Chinese Medicine,2020,38(8):189-192.

[8] Xi S,Wang L.Effects of Oblique Round Needle Combined with Needle-Warming Moxibustion on Serum Levels of TXB2 and TNF-α and Pain in Patients with LDH[J].Journal of Clinical Acupuncture and Moxibustion,2020,36(12):44-48.

[9] Sun W,Su X,Liu Y,et al. Effect of Warm Acupuncture Combined with Lumbar Core Muscle Strength Training on Rehabilitation Effect, Quality of Life and Serum Inflammatory Factors in Patients with Lumbar Disc Herniation[J].Progress in Modern Biomedicine,2020,20(22):4307-4310,4400.

[10] Chen L,Chen C,Wang B,et al.The Effect of Three-step Seven-method Massage on Lumbar

Intervertebral Disc Herniation[J].China Foreign Medical Treatment,2021,40(7):175-177.

[11] Zhong X,Liu J,Wang Y,et al.Which of the acupuncture treatment regimen for lumbar disc herniation is more effective and safer: A protocol for systematic review and network meta-analysis.Medicine,2021,100(12):25199.

[12] He J,Tang D,Wu X,et al.Clinical Efficacy and Safety Evaluation of Miao Medicine Crossbow Liquid Combined with Warm Acupuncture for Treatment of Lumbar Disc Herniation[J].Chinese Archives of Traditional Chinese Medicine,2019,37(10):2478-2482.

[13] Cui J.The Therapeutic Effect of Warm Acupuncture on Lumbar Disc Herniation and Its Effect on Serum β-Endorphin and Inflammatory Factors[J].The Journal of Cervicodynia And Lumbodynia,2019,40(2):244-245.

[14] Zhang H,Wang S,Dong B,et al.Effect of Acupuncture at Shenshu Point (BL 23) on Nerve Conduction Velocity in Rats with Lumbar Intervertebral Disc Herniation[J].Jilin Journal of Traditional Chinese Medicine,2019,39(8):1072-1075.

[15] Chen Z,Zheng Q,Chen S,et al.Warming acupuncture combined with "three steps and seven methods" of tuina for chronic nonspecific low back pain of yang deficiency and cold-dampness blockage: a randomized controlled trial[J].Chinese Acupuncture & Moxibustion,2022,42(5):505-510.

