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CLINICAL RESEARCH

Clinical Study of Bushen Tongbi Soup Combined with Massage and Traction in the Treatment of Patients with Lumbar Disc Herniation

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Keywords

Bushen Tongbi soup, massage and traction, Lumbar disc herniation, Lumbar joint range of motion

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Abstract

Objective The clinical efficacy of Bushen Tongbi soup combined with massage and traction in the treatment of patients with lumbar disc herniation (LDH) was explored. **Methods** 80 LDH patients who were treated in our hospital from January 2017 to June 2018 were taken as the study subject, and they were randomly divided into a control group and an observation group, with 40 cases in each group. Patients in the control group were treated with massage and traction, and those in the observation group were additionally given Bushen Tongbi soup on the basis of the control group. The clinical efficacy, lumbar spine function and pain scores, lumbar joint range of motion, and SF-36 health questionnaire scores were compared between the two groups. **Results** The total clinical effective rate in the observation group was significantly higher than that in the control group (P<0.05). After the treatment, the score of the Japanese orthopaedic association (JOA), lumbar flexion and lumbar posterior extension angle, and the scores of 8 dimensions in SF-36 scale were obviously higher than those before the treatment in both groups (P<0.05), and those in the observation group were markedly higher than those in the control group (P<0.05). After the treatment, the visual analogue scores (VASs) in the two groups were distinctly lower than those before the treatment (P<0.05), and the score in the observation group was significantly lower than that in the control group (P<0.05). **Conclusion** Bushen Tongbi soup combined with massage and traction can effectively alleviate the clinical symptoms of LDH patients, ameliorate lumbar spine function and lumbar joint range of motion, and improve the life quality of patients.

Introduction

Lumbar disc herniation (LDH) is one of the common diseases in clinical orthopedics, which mostly occurs in people aged 20 to 40. The clinical manifestations of LDH patients include lumbago, radioactive pain in lower limbs, neurological dysfunction and so on. In

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severe cases, there are risks of limited movement, loss of laboring capacity and even disability. Taking timely and effective treatment measures is the key to improve the prognosis of LDH patients and reduce the disability rate. At present, the treatment of LDH is mainly divided into surgical treatment or conservative treatment. Among them, surgical treatment has large trauma and many complications. Therefore, conservative treatment is the first choice for most patients[1]. Traditional Chinese medicine has the advantages of good curative effect, low cost and high safety in the conservative treatment of LDH. Massage is a traditional therapy based on the theory of viscera and meridians in traditional Chinese medicine, which can improve the therapeutic effect of LDH in coordination with other traditional Chinese medicine therapies such as oral administration of herbal medicines and fuming or steaming[2~ 3]. It is believed in traditional Chinese medicine that LDH is caused by the sluggish circulation of Qi of the bladder meridian of Foot-Taiyang and gallbladder meridian of Foot-Shaoyang resulting from the invasion of pathogenic Qi of wind, cold, damp and heat. Its main pathogenesis is liver and kidney deficiency, Qi stagnation and blood stasis. Therefore, the administration of medicine should be mainly to tonify the kidney and bones, and relieve rheumatism and pain[4]. At present, there is no study on the treatment of LDH patients with Bushen Tongbi soup combined with massage and traction. This paper aims to explore the clinical efficacy of Bushen Tongbi soup combined with massage and traction in the treatment of LDH patients to provide reference for the clinical treatment of LDH. The results of the research are reported as follows.

Materials and methods

General information

80 LDH patients who were treated in our hospital from January 2017 to June 2018 were taken as the study subject, and randomly divided into an observation group (n=40) and a control group (n=40). There was no statistically significant difference in gender, age and course of disease 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		Observation group (n=40)	Control group (n=40)	χ^2/t	P
Gender (cases)	Male	25	28	0.503	0.478
	Female	15	12		
Age (years old)		57.85±1.52	58.22±1.66	1.040	0.302
Course of disease (years)		7.55±1.39	7.89±1.44	1.074	0.286
Segment of focus (cases)	L3~L4	7	9	0.566	0.753
	L4~L5	26	24		
	L5~S1	8	6		

Inclusion criteria

(1) Patients are diagnosed with LDH by clinical examination and imaging examination, such as lumbar plain film, CT scanning and Magnetic Resonance Imaging (MRI)[5]; (2) LDH syndrome stagnation of vital Energy and blood stasis according to syndrome differentiation of traditional Chinese medicine: stabbing pain in lumbar and legs, disease worsening at night and alleviated at daytime, stiffness of waist, limited pitching rotation, dark purple tongue nature or ecchymosis on tongue, and tight or unsmooth stringy pulse[6]; (3) Patients with complete clinical data, no allergic reaction to Bushen Tongbi soup and no indications for surgery.

Exclusion criteria

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(1) Patients with skin diseases, such as lumbar abscess and eczema, and local skin damage, who cannot tolerate massage; (2) Patients with infectious diseases such as hepatitis and tuberculosis; (3) Patients with severe heart, liver, kidney and other organ dysfunctions, malignant tumors and mental disorders; (4) Pregnant or lactating women.

Methods

Patients in the control group were treated with massage and traction. Traction: The patients were asked to take the supine position and set 50%~80% of their own mass as the traction weight, 20~35 min each time, once a day. Massage: The patients were asked to take the prone position. The bladder meridian of Foot-Taiyang and gallbadder meridian of Foot-Shaoyang were repeatedly massaged along the meridians, the acupuncture points, including a marked tenderness point (namely Ashi), Huantiao (GB30) and Weizhong (BL40), at the waist were pressed for 5 min, and the pathological area of the lumbar vertebra was pressed continuously for 5 min, 30 min each time, once a day. Patients in the observation group were given Bushen Tongbi soup on the basis of the control group. The prescription includes 15 g *tu-chung*, 12 g each *parasitic loranthus*, *rhizoma cibotii*, *achyranthes bidentata* and *radix angelicae tuhuo*, 10 g *Poria cocos*, 9 g each *radix sileris*, *root of Chinese clematis*, *Angelica sinensis*, *bighead atractylodes rhizome* and *Ligusticum wallichii*, 6 g each *cassia twig* and *liquorice*, and 3 g *cinnamon*. All the herbs were decocted with 1000 mL clear water, 400 mL potion was taken, and 200 mL potion was taken in the morning and evening. Patients in both groups were treated for 3 weeks.

Observational indexes

(1) Clinical efficacy[7]: After 3 weeks of the treatment, the clinical symptoms, such as pain in waist and lower extremities, in the two groups were observed and the clinical treatment effect was evaluated. Cured: Pain in waist and lower extremities completely disappears, and the straight leg can be raised >80°; Markedly effective: Pain in waist and lower extremities is significantly relieved, and the straight leg can be raised >60°; Effective: Pain in waist and lower extremities is partially relieved, the straight leg can be raised >45°, and daily life and work are limited; Ineffective: Clinical symptoms such as pain in waist and lower extremities are not relieved, and daily life and work are limited; (2) Lumbar spine function and pain scores: Before and 3 weeks after the treatment, the lumbar spine function in the two groups was assessed with the Japanese Orthopaedic Association (JOA) assessment scale[6]. The total JOA score was 30 points. The higher the score, the more serious the lumbar spine function was damaged. At the same time, visual analogue score (VAS)[8] was used to evaluate the pain intensity in the two groups. The higher the score, the more intense the pain; (3) Lumbar joint range of motion: The range of motion of lumbar flexion and extension was recorded before and 3 weeks after the treatment; (4) SF-36 scale: Before and 3 weeks after the treatment, SF-36 health questionnaire[9] was used to evaluate the life quality of patients in the two groups. SF-36 includes 8 dimensions: physiological function (PF), role-physical (RP), bodily pain (BP), general health (GH), vitality (VT), social functioning (SF), role-emotional (RE) and mental health (MH). The higher the score, the stronger the function of this dimension.

Statistical methods

The statistical analysis was conducted using SPSS 20.0. The enumeration data were compared using χ^2 test. The measurement data were presented in mean ± standard deviation （ $\bar{x}\pm s$ ）. Differences between groups were compared with one-way analysis of variance. LSD test was used for pairwise comparisons between groups. Rank sum test was used for comparisons of ranked data. $P<0.05$ was considered to be statistically significant.

Results

Comparison of clinical efficacy between the two groups

The total effective rate of clinical treatment in the observation group was significantly higher than that in

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the control group (P<0.05), as shown in Table 2.

Table 2 Comparison of efficacy between the two groups (cases, %)

Groups	Number of cases	Cured	Markedly effective	Effective	Ineffective	Total effective rate
Observation group	40	11 (27.50)	18 (45.00)	8 (20.00)	3 (7.50)	37 (92.50)
Control group	40	9 (22.50)	10 (25.00)	11 (27.50)	10 (25.00)	30 (75.00)
χ^2 value						4.501
P value						0.034

Note: compared with before treatment: $^*P$<0.05

Comparison of lumbar spine function and pain scores between the two groups before and after treatment

Before treatment, there was no significant difference in VAS and JOA scores between the two groups (P>0.05); however, after treatment, the VAS scores of the two groups were obviously lower than those before treatment (P<0.05), and the score of the observation group was markedly lower than that of the control group (P<0.05). After treatment, JOA score in the two groups was distinctly higher than that before treatment (P<0.05), and the score in the observation group was significantly higher than that in the control group (P<0.05). The details were listed in Table 3.

Comparison on lumbar joint range of motion between the two groups before and after treatment

Prior to treatment, difference in lumbar flexion and lumbar extension angles between the two groups was not significant (P>0.05). After treatment, the lumbar flexion and extension angles in the two groups were obviously larger than those before treatment (P<0.05), and the angles in the observation group were distinctly greater than those in the control group (P<0.05). The details were listed in Table 4.

Comparison of SF-36 scale scores between the two groups before and after treatment

Before treatment, there was no significant difference in the scores of 8 dimensions including PF, RP, BP, GH, VT, SF, RE and MH in SF-36 scale between the two groups (P>0.05); however, after treatment, the scores of the 8 dimensions in the two groups were obviously higher than those before treatment (P<0.05), and the scores in the observation group were markedly higher than those in the control group (P<0.05), as shown in Table 5.

Table 3 Comparison of function and pain scores between the two groups ($\bar{x}\pm s$, points)

Groups	Number of cases	VAS score		JOA score	
		Before treatment	After treatment	Before treatment	After treatment
Observation group	40	6.65±0.66	2.48±0.6*	14.58±2.45	26.93±3.55*
Control group	40	6.71±0.72	2.93±0.8*	14.67±2.48	23.29±3.04*
t value		0.389	2.846	0.163	4.926
P value		0.699	0.006	0.871	0.000

Note: compared with before treatment: $^*P$<0.05

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Table 4 Comparison on lumbar joint range of motion between the two groups of LDH patients before and after treatment（ $\bar{x}\pm s$, degrees)

Groups	Number of cases	Lumbar flexion		Lumbar extension	
		Before treatment	After treatment	Before treatment	After treatment
Observation group	40	41.38±4.05	44.21±4.58*	16.75±2	18.08±2.55*
Control group	40	41.59±4.01	47.28±4.22*	16.27±2.22	20.17±2.49*
t value		0.233	3.118	1.020	3.709
P value		0.816	0.003	0.313	0.000

Note: compared with before treatment: *P<0.05

Table 5 Comparison on SF-36 scores of LDH patients before and after intervention （ $\bar{x}\pm s$, points)

Groups	Number of cases	PF		RP	
		Before treatment	After treatment	Before treatment	After treatment
Observation group	40	45.22±10.05	75.58±14.22*	18.44±3.55	23.48±2.58*
Control group	40	43.08±10.69	57.88±14.41*	19.05±3.25	22.43±2.23*
t value		1.212	7.262	1.053	2.558
P value		0.228	0.000	0.294	0.012
Groups	Number of cases	BP		GH	
		Before treatment	After treatment	Before treatment	After treatment
Observation group	40	40.69±5.52	66.18±20.05*	20.41±3.33	34.52±3.39*
Control group	40	39.17±4.11	56.38±15.24*	19.75±2.02	26.44±4.04*
t value		1.835	3.232	1.408	12.726
P value		0.069	0.002	0.162	0.000
Groups	Number of cases	VT		SF	
		Before treatment	After treatment	Before treatment	After treatment
Observation group	40	21.58±2.23	29.99±4.28*	36.33±6.58	59.69±17.11*
Control group	40	22.49±3.33	28.04±4.23*	37.41±8.11	46.04±12.55*
t value		1.886	2.692	0.859	5.344
P value		0.061	0.008	0.392	0.000
Groups	Number of cases	RE		MH	
		Before treatment	After treatment	Before treatment	After treatment
Observation group	40	31.11±5.33	49.75±7.14*	28.77±5.52*	52.14±10.02*
Control group	40	32.58±5.49	45.36±8.44*	26.69±7.48*	48.89±8.44*
t value		1.596	3.297	1.859	2.061

Note: compared with before treatment: *P<0.05

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Discussion

LDH is caused by retrograde affection of lumbar intervertebral disc, which causes the fibrous ring to be broken by external force, resulting in the protrusion of nucleus pulposus tissue and the compression of adjacent spinal nerve roots, resulting in clinical symptoms such as lumbago and numbness of lower limbs. Traditional Chinese medicine classifies LDH into "lumbago" and "rheumatism". It is recorded in General Treatise on the Cause and Symptoms of Diseases that "kidney-Qi deficiency is caused by wind evil; Overexertion results in kidney deficiency which then contributes to susceptibility to cold wind, and then the conflict between wind chill and vital Qi leads to waist and leg pain". The internal cause of the disease is deficiency of kidney essence and lack of Qi and blood, while the external cause is obstruction of the meridians and collaterals with wind-cold-wetness evil. This disease can be divided into four syndrome types: blood stasis, cold-dampness, damp and heat and deficiency of liver and kidney. Therefore, the main treatment principles of traditional Chinese medicine are tonifying the kidney and bones, dredging the meridians and relieving pain. There are a variety of traditional Chinese medicine treatments for LDH, including Chinese medicine fumigation, oral administration of herbal medicines, massage, acupuncture, etc. Among them, massage therapy has a significant effect on LDH, and there are many related clinical research reports. Massage has the advantages of significant effect and low recurrence rate, which can dredge meridians and activate collaterals, remove arthralgia and relieve pain[1~2,10]. Bushen Tongbi soup is a prescription composed of *achyranthes bidentata*, *parasitic loranthus*, etc., which can tonify liver and kidney and strengthen tendons and bones, and has a good effect on improving the function of lumbar disc[11].

This study explored the clinical efficacy of Bushen Tongbi soup combined with massage and traction in the treatment of LDH patients, and analyzed the impact of the combined treatment on life quality of patients. The results showed that the total effective rate of clinical treatment in the observation group was significantly higher than that in the control group. After the treatment, JOA scores, lumbar flexion and extension angles, and 8 dimension scores in SF-36 scale in the two groups were obviously higher than those before the treatment, and those in the observation group were markedly higher than those in the control group. After the treatment, the VAS score in the two groups was evidently lower than that before the treatment, and the score in the observation group was significantly lower than that in the control group. Therefore, it is suggested that Bushen Tongbi soup combined with massage and traction can effectively alleviate the clinical symptoms, and improve the lumbar function and life quality of patients with LDH. Modern studies have reported that traction and massage manipulation can increase the intervertebral space at the lesion site, adjust the position of intervertebral disc and adjacent spinal nerve roots, promote the recovery of nucleus pulposus tissue, relieve its compression on nerve roots, and reduce pain. Secondly, massage and traction can alleviate muscle spasm around the diseased spine, enhance muscle strength, correct abnormal posture of the spine, and promote the balance of muscle strength around the spine. In addition, massage can interfere with immune system function, down-regulate the expression levels of pro-inflammatory factors, and reduce hyperalgesia[12]. Bushen Tongbi soup is composed of medicinal materials including *tu-chung*, *parasitic loranthus*, *rhizoma cibotii*, *achyranthes bidentata*, *radix angelicae tuhuo*, *Poria cocos*, *radix sileris*, *root of Chinese clematis*, *Angelica sinensis*, *bighead atractylodes rhizome*, *Ligusticum wallichii*, *cassia twig*, *liquorice* and *cinnamon*. *Tu-chung* and *parasitic loranthus* are taken as the monarch drug to tonify the liver and kidney and strengthen the muscles and bones. *Rhizoma cibotii*, *achyranthes bidentata* and *Ligusticum wallichii* are taken as the ministerial drug to tonify the liver and kidney, expel wind and dispel cold, dredge the collaterals and remove arthralgia. It is complemented by *radix angelicae tuhuo* to relieve arthralgia and pain, *Poria cocos* to clear damp and promote diuresis, *radix sileris* to induce diaphoriesis to dispal wind, *root of Chinese*

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clematis to eliminate wind and remove dampness, *Angelica sinensis* to activate blood circulation and relieve pain, *bighead atractylodes rhizome* to invigorate the spleen and Qi, and *Ligusticum wallichii* to promote blood circulation and Qi. In addition, *cassia twig* and *cinnamon* are used to warm the meridians, and *liquorice* is used to relieve spasm and pain and harmonize all drugs. The combination of all materials can tonify the liver and kidney, activate blood circulation and remove numbness[7,13]. A modern pharmacological study[14] has suggested that *Folium Eucommiae alcohol* can reduce the content of serum inflammatory factors, inhibit inflammatory response, regulate bone metabolism and improve bone mineral density. Achyranthis polysaccharide, an effective component of *achyranthes bidentata*, can regulate immune function, reduce body inflammation, modulate immune microenvironment of lesion area, and alleviate pain symptoms. The compatibility of *radix angelicae tuhuo* and *parasitic loranthus* contains effective ingredients such as *quercetin*, *marmesin*, and *marmesinin*., which has the effects of anti-oxidation and protecting the central nervous system, and can protect the liver and kidney functions by inhibiting the release of pro-inflammatory factors, regulate vascular endothelial growth factor and inflammatory factor, and participate in the regulation of physiological processes of intervertebral disc cells such as autophagy, apoptosis and senescence, so as to improve the lumbar function and life quality of patients with LDH[15].

In conclusion, Bushen Tongbi soup combined with massage and traction can effectively alleviate the clinical symptoms of LDH patients, ameliorate the lumbar function and lumbar joint range of motion, and improve life quality of patients.

Declaration of conflict-of-interest

The authors declare no conflict-of-interest.

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