Research Paper

The Value of Pubescent *Angelica* and *Loranthus* Decoction Combined with Traditional Chinese Medicine in Lumbar Disc Herniation

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We attempt to investigate the value of pubescent *Angelica* and *Loranthus* decoction combined with traditional Chinese medicine bone trauma manipulation in the treatment of lumbar disc herniation with liver and kidney deficiency and the effect on the Japanese orthopedic association score. We selected 100 lumbar disc herniation patients with liver and kidney deficiency admitted to our hospital from September 2021 to September 2022 and divided them into an experimental group (n=50) and a control group (n=50) according to the envelope randomization method. Control group received pubescent *Angelica* and *Loranthus* decoction treatment, after receiving the same treatment as control group, experimental group conducted traditional Chinese medicine bone trauma manipulation. Compared both groups on the efficacy, the function of the lumbar spine, pain and inflammatory response before and after 6 w of treatment. Experimental group possessed higher total effective rate after treatment with pubescent *Angelica* and *Loranthus* decoction combined with traditional Chinese medicine bone trauma manipulation than control group after treatment with pubescent *Angelica* and *Loranthus* decoction (94.00 % *vs.* 80.00 %) ($p<0.05$). After 6 w of treatment, Japanese orthopedic association and functional independence measure score increased, but visual analogue scoring and Oswestry disability index score decreased in both groups and experimental group possessed higher Japanese orthopedic association and functional independence measure score than control group, while lower visual analogue scoring and Oswestry disability index score than control group ($p<0.05$). After 6 w of treatment, all inflammatory response indexes decreased in both groups and experimental group possessed lower interleukin-1 and interleukin-8 indexes than control group ($p<0.05$). In the treatment of lumbar disc herniation disease with liver and kidney deficiency, the efficacy of pubescent *Angelica* and *Loranthus* decoction combined with traditional Chinese medicine bone trauma manipulation was significant, which helped to reduce the inflammatory response levels, alleviate the degree of back pain and promote the improvement of their lumbar spine function.

Key words: Lumbar disc herniation, pubescent *Angelica* and *Loranthus* decoction, traditional Chinese medicine, bone trauma

Lumbar Disc Herniation (LDH) is more common in spinal surgery and is usually caused by degenerative changes in various parts of the lumbar disc, causing compression of the spinal nerves in the corresponding areas[1,2]. In traditional Chinese medicine, LDH belongs to the category of lumbar and leg pain or paralysis, the root cause of which is deficiency of the liver and kidneys, and the treatment is based on clearing the channels and relieving pain, tonifying the liver and kidneys, and strengthening the tendons and bones[3,4]. Pubescent *Angelica* and *Loranthus* decoction is a commonly used formula for LDH with liver and kidney deficiency, which is mainly composed of ingredients such as radix *Achyranthis bidentatae* (*A. bidentatae*), white peony, radix angelicae tuhuo, *Codonopsis pilosula* (*C. pilosula*) and Angelicae *sinensis* (*A. sinensis*), which can benefit the kidneys, tonify the liver, nourish the qi and generate blood, can relieve the patient's lumbar spine pain to a certain extent, but the improvement of their

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inflammatory response by using pubescent *Angelica* and *Loranthus* decoction alone is not effective[5]. Combined with the use of traditional Chinese medicine bone trauma manipulation, it can correct the balance of the internal and external environment of the patient's spine and reduce the inflammatory response, thus improving the function of the lumbar spine. However, the mechanism of improvement of the inflammatory response in patients with LDH with liver and kidney deficiency by combining pubescent *Angelica* and *Loranthus* decoction with traditional Chinese medicine bone trauma manipulation still needs to be further investigated. Based on this, this study selected 100 LDH patients with liver and kidney deficiency, and investigated the value of the combination of the two regimens.

MATERIALS AND METHODS

General data:

We selected 100 LDH patients with liver and kidney deficiency admitted to our hospital from September 2021 to September 2022 and divided them into two groups according to the envelope randomization method. Control group consisted of 19 females and 31 males; ages were from 40 y to 77 y old, mean (57.40±5.56) y old; 24 cases of posterolateral type and 26 cases of intermediate type. Experimental group consisted of 18 females and 32 males; ages were from 41 y to 78 y old, mean (57.53±5.41) y old; 23 cases of posterolateral type and 27 cases of intermediate type. The baseline data of the two groups were comparable ($p>0.05$).

Inclusion criteria: Western medicine diagnosis of LDH referred to the relevant standard[6]; Chinese medicine diagnosis referred to the "Practice of Chinese Medicine Disease Diagnosis and Treatment"[7] and the identification and classification of liver and kidney deficiency type; all patients could communicate normally.

Exclusion criteria: Those who withdrew on their own midway; lumbar spine tuberculosis or vertebral metastases; lumbar spine deformity or severe calcification. The trial design of this study was reviewed and approved by the ethics committee of our hospital.

Treatment method:

Control group received pubescent *Angelica* and *Loranthus* decoction treatment with the following formula; 10 g of radix *A. bidentatae*, 10 g of white peony, 10 g of radix angelicae tuhuo, 10 g of *C. pilosula*, 10 g of *A. sinensis*, 6 g of *Ligusticum wallichii*, 10 g of radix Rehmanniae, 10 g of mistletoe, 3 g of *Asarum*, 10 g of *Poria cocos*, 10 g of radix sileris, 3 g of *Cinnamomum cassia*, 10 g of *Eucommia ulmoides*, 10 g of *Gentiana macrophylla*, 3 g of licorice. The above drugs were boiled with water to make 200 ml of the solution, which was administered twice daily at 100 ml each time for 6 w. On the basis of control group, experimental group conducted traditional Chinese medicine bone trauma manipulation. In relaxing massage; instruct the patient to take a prone position, relax the muscles of the patient's lower back and buttocks and apply an appropriate amount of sesame oil to the patient's lower back, then use the palm thrust method to accelerate the blood circulation of the affected area, while using the stacked palm method to press the patient's buttocks and lower back, paying attention to the massage from light to heavy until the patient can bear the maximum limit.

Repositioning technique: Expose the lumbar region fully, place two pillows on the patient's front hip and chest respectively, so that the lumbar region is suspended and the practitioner uses both thumbs to push along the middle of the patient's spine from bottom to top, repeating 8-10 times. Afterwards, the patient is instructed to grasp both sides of the treatment bed with both hands and press firmly with the tip of the right elbow against the side of the patient's vertebral body below the spinous process of the protruding segment and use the force of the body to keep pressing down for 1 min.

Acupoint massage: Use the thumbs to point and press on the Dachangshu, Shenshu, Ashi point, Kunlun acupoint on both sides of the patient's back, and then use the elbow to press on the Chengfu acupoint and Huantiao acupoint.

Exercise of joints: Instruct the patient to take a supine position and move the affected joints using traction on the lower limbs and straight leg raising techniques for 30 min each time, once a day for 6 w.

Observation indexes:

Efficacy: Made an evaluation according to relevant criteria[8], after treatment, patients with basic return to normal lumbar movement and disappearance of lumbar pain symptoms were said to be markedly effective, those with improved lumbar movement

and significant relief of lumbar pain symptoms were said to be effective and those who did not meet the above criteria were said to be ineffective.

Japan Orthopedic Association (JOA) score and Visual Analogue Scoring (VAS) score: The JOA[9] scale was applied to assess the function of the lumbar spine before and after 6 w of treatment in both groups, with a score of 17 points, higher score indicated better the function of the lumbar spine; the VAS[10] scale was also applied to assess the pain in both groups, with a total score of 0-10 points, higher score indicated more severe the pain.

Functional Independence Measure (FIM) and back pain Oswestry Disability Index (ODI): Adopted the FIM[11] scale to assess the functional recovery of both groups before and after 6 w of treatment, with a score of 10 points, higher score indicated better the functional recovery; adopted the ODI[12] scale to assess the degree of low back pain in both groups, with a total score of 50 points, higher score indicated more severe the low back pain. In inflammatory response; 3 ml of peripheral blood was drawn from both groups before and after 6 w of treatment, centrifuged and processed, and serum was collected to determine the Interleukin (IL)-1 index by cellular immunohistochemistry and the IL-8 index was also measured.

Statistical methods:

The measurement data were expressed as ($\bar{x}\pm s$), with independent samples t-test for comparison between groups and paired t-test for comparison within groups; the count data were expressed as [n (%)], with Chi-square (χ^2) test for comparison between groups. Data were analyzed with Statistical Package for the Social Sciences (SPSS) 23.0 software and $p<0.05$ indicated statistical differences.

RESULTS AND DISCUSSION

Experimental group possessed higher total effective rate after treatment with pubescent *Angelica* and *Loranthus* decoction combined with traditional Chinese medicine bone trauma manipulation than control group after treatment with pubescent *Angelica* and *Loranthus* decoction (94.00 % *vs.* 80.00 %) ($p<0.05$) as shown in Table 1.

After 6 w of treatment, JOA scores increased and VAS scores decreased in both groups, and experimental group possessed higher JOA scores but lower VAS scores than control group ($p<0.05$) as shown in Table 2.

After 6 w of treatment, FIM scores increased and ODI scores decreased in both groups, and experimental group possessed higher FIM scores but lower ODI scores than control group ($p<0.05$), as shown in Table 3. After 6 w of treatment, all inflammatory response indicators decreased in both groups, and experimental group possessed lower IL-1 and IL-8 indicators than control group ($p<0.05$), as shown in Table 4.

TABLE 1: COMPARISON OF CLINICAL EFFICACY BETWEEN BOTH GROUPS [n (%)]

Group	Number of examples	Markedly effect	Effective	Ineffective	Total effective rate
Experimental	50	26 (52.00)	21 (42.00)	3 (6.00)	47 (94.00)
Control	50	22 (44.00)	18 (36.00)	10 (20.00)	40 (80.00)
χ^2					4.332
p					0.037

TABLE 2: COMPARISON OF JOA SCORES AND VAS SCORES BETWEEN BOTH GROUPS ($\bar{x}\pm s$, POINTS)

Group	Number of examples	JOA Score		t	p	VAS Score		t	p
		Before treatment	After treatment			Before treatment	After treatment		
Experimental	50	10.55±2.12	13.48±2.26	7.325	0.001	6.86±1.26	2.54±0.48	9.374	0.001
Control	50	10.41±2.17	12.53±2.18	5.832	0.001	6.82±1.22	3.06±0.65	8.642	0.001
t		0.325	4.345			0.157	5.472	-	-
p		0.758	0.001			0.86	0.001	-	-

TABLE 3: COMPARISON OF FIM SCORES AND ODI SCORES BETWEEN BOTH GROUPS (x̄±s, POINTS)

Group	Number of examples	FIM Score		t	p	ODI Score		t	p
		Before treatment	After treatment			Before treatment	After treatment		
Experimental	50	3.45±0.64	6.42±1.28	8.326	0.001	46.32±3.22	24.56±2.20	25.725	0.001
Control	50	3.53±0.61	4.82±0.78	5.425	0.001	46.31±3.20	30.30±2.63	22.242	0.001
t		0.932	6.425			0.295	9.471	-	-
p		0.32	0.001			0.769	0.001	-	-

TABLE 4: COMPARISON OF INFLAMMATORY RESPONSES BETWEEN BOTH GROUPS (x̄±s, pg/ml)

Group	Number of examples	IL-1		t	p	IL-8		t	p
		Before treatment	After treatment			Before treatment	After treatment		
Experimental	50	97.82±9.08	72.72±7.40	9.425	0.001	85.66±8.78	53.76±5.40	21.328	0.001
Control	50	97.33±9.09	80.65±8.49	7.953	0.001	85.87±8.79	74.70±7.29	19.953	0.001
t		0.082	6.87			0.359	17.824	-	-
p		0.931	0.001			0.721	0.001	-	-

LDH is an important cause of low back pain in the middle-aged and elderly, whose pathogenesis is still unclear, mainly due to degenerative changes in the lumbar spine and intervertebral discs as the patient ages, resulting in rupture of the fibrous rings and protrusion of the nucleus pulposus tissue from them or into the spinal canal, causing some compression or irritation to the adjacent spinal nerve roots, resulting in lumbar pain[13]. In Chinese medicine, there is no name for LDH, but from a clinical point of view, it belongs to the category of paralysis and lumbago in Chinese medicine. Chinese medicine believes that the waist is the kidney, often due to deficiency of kidney essence, weakness of kidney qi, or damage to tendons and bones due to overwork, resulting in stasis of blood or invasion of wind, cold and dampness, causing obstruction of meridians and disorders of qi and blood, the root cause of lumbago is deficiency of liver and kidney, treatment should be based on resolving stasis and activating blood, benefiting qi and nourishing blood, relieving pain and clearing the channels.

In this study, we introduce pubescent *Angelica* and *Loranthus* decoction, in which radix *A. bidentatae*, radix rehmanniae and *Eucommia ulmoides* can strengthen the bones and tendons, and tonify the liver and kidneys; mistletoe and radix angelicae tuhuo can relieve pain and paralysis, dispel wind and dampness, and open up paralysis and invigorate the channels; *Gentiana macrophylla* and radix sileris can help relieve pain and disperse dampness and prevent wind; *Ligusticum wallichii*, *Angelica* and white peony can invigorate and tonify the blood; *Asarum* and *Cinnamomum cassia* can nourish the blood and benefit the qi, warm the channels and disperse cold; *C. pilosula* and *Poria cocos* can strengthen the spleen and replenish qi, the combination of these herbs is effective in strengthening the bones and tendons, tonifying the liver and kidneys, and activating meridians to stop pain, but the effect of a single pubescent *Angelica* and *Loranthus* decoction on the patient's inflammatory response is not yet satisfactory[14]. Traditional Chinese medicine bone trauma manipulation has a long history and "the Golden mirror of medicine" says; "the manipulation of two hands to place the injured tendons and bones, so that they still return to the old-do not know their suffering". Bone trauma manipulation is an economical and easy to master therapy, which not only relaxes the patient's stiff muscles, but also accelerates blood circulation, adjusts qi and blood, unblocks the meridians and balances the body's yin and yang, which has a good effect on relieving the patient's back pain and improving the function of the lumbar spine. The results of this study showed that experimental group possessed higher total effective rate after treatment with pubescent *Angelica* and

Loranthus decoction combined with traditional Chinese medicine bone trauma manipulation than control group after treatment with pubescent *Angelica* and *Loranthus* decoction (94.00 % *vs.* 80.00 %) ($p<0.05$). After 6 w of treatment, JOA and FIM score increased, but VAS and ODI score decreased in both groups and experimental group possessed higher JOA and FIM score than control group, while lower VAS and ODI score than control group ($p<0.05$). It is suggested that pubescent *Angelica* and *Loranthus* decoction combined with traditional Chinese medicine bone trauma manipulation can reduce the degree of low back pain and improve the function of the lumbar spine in LDH patients with liver and kidney deficiency, with significant efficacy, which is consistent with the results of previous studies[15]. Analysis of the reasons for this shows that traditional Chinese medicine bone trauma manipulation mainly stimulates local acupuncture points in the body to reduce sympathetic excitation points in the body, thereby accelerating blood circulation, and relieving vascular and muscle spasm in the lumbar region. Used in combination with pubescent *Angelica* and *Loranthus* decoction, it can reduce swelling and pain, resolve blood stasis and invigorate blood circulation, tonify the liver and kidney and release nerve root compression and promote improved lumbar spine function. One study found that immune and inflammatory responses play an important role in the development of neuropathic pain[16]. When serum levels of IL-1 and IL-8 increase, this enhances excitatory synaptic transmission and weakens inhibitory synaptic transmission processes, resulting in central sensitization, which in turn causes increased neuropathic pain and worsening of the condition. In this study, it was found that after 6 w of treatment, all inflammatory response indexes decreased in both groups, and experimental group possessed lower IL-1 and IL-8 indexes than control group ($p<0.05$). It is suggested that pubescent *Angelica* and *Loranthus* decoction combined with traditional Chinese medicine bone trauma manipulation treatment can reduce the inflammatory response of LDH in the liver and kidney deficiency type. The factors contributing to this may be that traditional Chinese medicine bone trauma manipulation treatment can significantly reduce the pressure within the intervertebral disc, help the herniation to retract, change the position of the nerve root and the herniation, accelerate the local blood circulation of the patient, reduce the pressure on the nerve root and relieve the pain. The use of pubescent *Angelica* and *Loranthus* decoction combined with traditional Chinese medicine bone trauma manipulation accelerated the metabolism of the diseased tissue, which was conducive to regulating the expression of IL-1 and IL-8 indicators in patients and promoting a lower inflammatory response. However, there are still shortcomings in this study, such as the short duration of the study, which does not allow for the evaluation of the long-term effects of pubescent *Angelica* and *Loranthus* decoction combined with traditional Chinese medicine bone trauma manipulation, so a longer case analysis could be conducted to improve the accuracy of the results.

In summary, in the treatment of LDH with liver and kidney deficiency, the efficacy of pubescent *Angelica* and *Loranthus* decoction combined with traditional Chinese medicine bone trauma manipulation is significant, helping to reduce the inflammatory response levels, reduce the degree of lumbar pain and promote the improvement of lumbar spine function, and can be promoted.

Author's contributions:

Xiaoyan Ding and Xuefeng Liu have contributed equally to this work.

Conflict of interests:

The authors declared no conflict of interests.

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