Scientific Research Publishing

Open Journal of Orthopedics, 2024, 14, 312-324
https://www.scirp.org/journal/ojo
ISSN Online: 2164-3016
ISSN Print: 2164-3008

Clinical Observation of the Hot and Humid Compress Therapy of Traditional Chinese Medicine in the Treatment of Qi Stagnation and Blood Stasis Type of Lumbar Disc Herniation

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How to cite this paper: Song, H.L., Xu, K., Zhu, H., Xu, Z.W., Li, P. and Wang, R.K. (2024) Clinical Observation of the Hot and Humid Compress Therapy of Traditional Chinese Medicine in the Treatment of Qi Stagnation and Blood Stasis Type of Lumbar Disc Herniation. *Open Journal of Orthopedics*, **14**, 312-324.
https://doi.org/10.4236/ojo.2024.147027

Received: February 14, 2023
Accepted: July 26, 2024
Published: July 29, 2024

Abstract

Background: Although a number of studies have reported that the hot and humid compress from traditional Chinese medicine (TCM) is effective in treating lumbar disc herniation (LDH) with qi stagnation and blood stasis, clinical evidence is limited. **Objective:** The purpose of this study is to provide high-quality evidence to support the effectiveness of the traditional Chinese hot and humid compress in the treatment of LDH with qi stagnation and blood stasis. **Methods:** From October 2021 to November 2023, 86 patients with LDH of qi stagnation and blood stasis type were recruited in our hospital and divided into a control (n = 43) and an observation group (n = 43) according to the random number table method. The control group was given routine clinical treatment, and the observation group was treated with the hot and humid compress therapy for two weeks. The visual analogue scale (VAS) score, Japanese Orthopaedic Association (JOA) score, TCM syndrome score, serum interleukin-6 (IL-6), serum interleukin-1β (IL-1β), and tumor necrosis factor-α (TNF-α) were observed and compared between the two groups before and after treatment, and the clinical efficacy of the two groups was evaluated. **Results:** After treatment, the VAS score, TCM symptom score, and serum IL-6, IL-1β, and TNF-α levels decreased in both groups ($P < 0.05$), and those in the observation group were significantly lower than those in the control group ($P < 0.05$). After treatment, the JOA scores of both groups increased ($P < 0.05$), and those in the observation group were significantly higher than those in the control group ($P < 0.05$). The total effective rate of the observation group was 93.02% (40/43) and that of the control group was 72.09% (31/43; $P < 0.05$). **Conclusions:** The hot and humid compress of traditional Chinese

medicine can effectively relieve pain, restore lumbar function, improve TCM syndromes, reduce the level of inflammatory factors, and have a curative effect in treating LDH.

Keywords

Chinese Medicine Hot and Humid Compress, Lumbar Disc Herniation, Qi Stagnation and Blood Stasis Type, TCM Symptom Score, Clinical Efficacy

1. Introduction

Lumbar disc herniation (LDH) is a common chronic degenerative disease affecting the lumbar spine. Clinical manifestations include low back and leg pain, lumbar stiffness, limited mobility, and in severe cases, paralysis [1]. An epidemiological survey [2] found the annual incidence of LDH in China to be about 15.2%, affecting more male than female patients. The increasing incidence of LDH has brought a heavy burden to people's health and quality of life. Conservative treatment is preferred for lumbar disc herniation, and studies have shown no significant difference in the long-term efficacy (>2 years) between conservative and surgical treatment for patients with LDH [3] [4]. The traditional Chinese medicine (TCM) hot and humid compress is a conservative treatment method that has been shown to have a significant effect on the clinical treatment of LDH. This study aims to evaluate the efficacy of the hot and humid compress in the treatment of LDH of qi stagnation and blood stasis type, in order to provide high-quality clinical evidence.

2. Materials and Methods

2.1. Research Objects and Grouping

From October 2021 to November 2023, 86 patients with LDH of qi stagnation and blood stasis were recruited from the outpatient department of Fangchenggang Hospital Affiliated with Guangxi University of Chinese Medicine. According to the random number table method, they were divided into a control and an observation group, with 43 cases in each group; a detailed flowchart of this process is provided in **Figure 1**. The control group included 22 males and 21 females, aged 25 - 67 years (average 45.13 ± 5.78). The course of disease was 1 - 7 months, with an average of 3.57 ± 0.94 months. The observation group had 23 males and 20 females, aged 26 - 67 years (average 45.37 ± 5.59). The course of disease was 1 - 6 months, with an average of 3.62 ± 0.92 months. There was no significant difference in general data between the two groups ($P > 0.05$). This study was conducted in compliance with the Declaration of Helsinki, and was approved by the Ethics Committee of Fangchenggang Hospital Affiliated with Guangxi University of Chinese Medicine (ethical approval number: 2021052901).

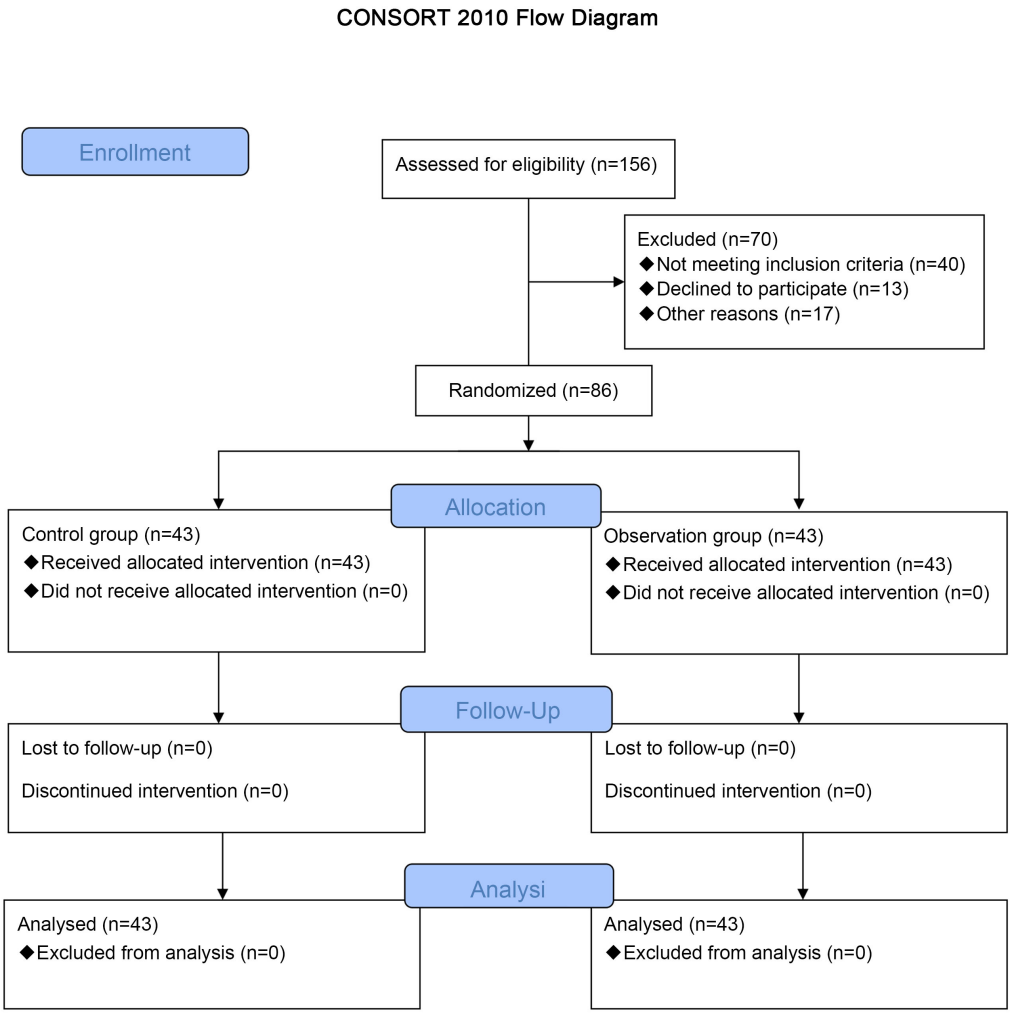


Figure 1. A flowchart of the study.

2.2. Case Selection

The diagnostic criteria were as follows: 1) Western diagnostic criteria: according to the "lumbar disc herniation diagnosis and treatment and rehabilitation management guidelines" [5], low back pain with lower extremity radioactive channeling pain, straight leg raising test positive or weak positive, and CT or MRI showed lumbar disc herniation; and 2) TCM dialectical criteria: meet the "Chinese medicine rehabilitation clinical practice guidelines·low back pain (lumbar disc herniation)" [6] in the qi stagnation and blood stasis type of low back pain diagnostic criteria, lumbocrural tingling, waist stiffness, limited activity, tongue dark purple or ecchymosis, and pulse astringent or string. The inclusion criteria were as follows: 1) meet the above western medicine and Chinese medicine diagnostic criteria; 2) aged between 18 to 70 years old; 3) patients with good compliance who volunteered to participate in this trial and signed informed consent; and 4) patients who had not received LDH-related treatment in the past month had no interference with this test. The exclusion criteria were as follows: 1) combined with lumbar tuberculosis, lumbar spinal stenosis, or other diseases; 2) low

back skin damage or infection; and 3) patients with loss of clinical and follow-up data.

2.3. Treatment Methods

The control group was given routine clinical treatment; patients were instructed to lay on a hard bed to rest, avoid bending and weight-bearing, and carry out functional exercises for lumbar and back muscles. Patients were administered one celecoxib capsule (Jiangsu Zhengda Qingjiang Pharmaceutical Co., Ltd., Approval No.: H20193414; specification model: 0.2 g × 12 s) orally twice a day. The course of treatment was two weeks. The observation group was treated with the TCM hot and humid compress therapy in addition to the treatment received by the control group. The prescription consisted of 15 g Radix Aconiti Preparata, 15 g Radic Aconiti Kusnezoffii Preparata, 15 g Safflower, 15 g Radix Angelicae Dahuricae, 15 g Ginger Processed Pinellia, 15 g Arisaema Cum Bile, 15 g Rhizoma Sparganii, 15 g Rhioxma Curcumae Aeruginosae, 15 g Vinegar Frankincense, 15 g Vinegar Myrrh, 15 g Rortex Phellodendri, 15 g Fructus Gardeniae, 20 g Rhizoma Homalomenae, 15 g Clove, 20 g Cortex Erythrinae Seu Kalopanacis, 30 g Caulis Piperis Kadsurae (Guangxi), 30 g Caulis Spatholobi, 15 g Incised Notopterygium, 30 g Radix Zanthoxyli, 15 g Ramulus Cinnamomi, 15 g Radix Saposhnikoviae, and 15 g Turmeric. After the above drugs were decocted with water, the dressing was immersed in 38˚C - 43˚C liquid medicine and applied to the affected area without dripping water. The dressing was frequently replaced or drenched liquid to maintain humidity and temperature. Each treatment lasted for 30 min once a day for two weeks.

2.4. Observation Indicators

The visual analogue scale (VAS) score was out of 10 points, with higher scores indicating more severe pain (**Table 1**). The Japanese Orthopaedic Association (JOA) score [7] included subjective symptoms, clinical signs, and daily living ability, out of a total score of 29 points, with higher scores indicating better lumbar function (**Table 2**). The TCM syndrome score was based on the "Clinical Practice Guidelines for Rehabilitation of Traditional Chinese Medicine·Low Back Pain (Lumbar Disc Herniation)" [6], including symptoms of lumbocrural tingling, lumbar stiffness, limited activity, dark purple tongue or ecchymosis, and pulse sinking or string, scored out of three points, with higher scores indicating more serious symptoms (**Table 3**). Serum interleukin-6 (IL-6), serum interleukin-1β (IL-1β), and tumor necrosis factor-α (TNF-α) levels were measured by enzyme-linked immunosorbent assay. The above indices were evaluated one day before treatment and on the second day after the test.

Table 1. Visual analogue scale (VAS) score.

Length (cm)	0	1	2	3	4	5	6	7	8	9	10
Score (points)	0 (no pain)	1	2	3	4	5	6	7	8	9	10 (severe pain)

Table 2. Japanese Orthopaedic Association (JOA) score.

Categories	Score (points)	Categories	Score (points)	Categories	Score (points)
I. Subjective symptoms (9 points)		III. Daily activities limited (14 points)		IV. Bladder function (−6 - 0)	
i. Low back pain		i. Horizontal turn over		(a). Normal	0
(a). No pain	3	(a). Normal	2	(b). Mild limitation	−3
(b). Occasionally mild pain	2	(b). Mild limitation	1	(c). Obviously limited (urinary retention, urinary incontinence)	−6
(c). Frequent mild pain or occasional severe pain	1	(c). Obviously limited	0		
(d). Frequent or persistent severe pain	0	ii. Stand			
ii. Leg pain or stinging pain		(a). Normal	2		
(a). No pain	3	(b). Mild limitation	1		
(b). Occasionally mild pain	2	(c). Obviously limited	0		
(c). Frequent mild pain or occasional severe pain	1	iii. Wash up			
(d). Frequent or persistent severe pain	0	(a). Normal	2		
iii. Gait		(b). Mild limitation	1		
(a). Normal	3	(c). Obviously limited	0		
(b). Even if you feel muscle weakness, you can walk more than 500 meters	2	iv. Action flexion			
(c). Walking < 500 meters, that is, leg pain, tingling, weakness	1	(a). Normal	2		
(d). Walking < 100 meters, that is, leg pain, tingling, weakness	0	(b). Mild limitation	1		
II. Clinical signs (6 points)		(c). Obviously limited	0		
i. Straight-leg raising test		v. Sitting (about 1h)			
(a). Normal	2	(a). Normal	2		
(b). 30˚ - 70˚	1	(b). Mild limitation	1		
(c). <30˚	0	(c). Obviously limited	0		
ii. Sensory disturbance		vi. Lifting weight			
(a). No	2	(a). Normal	2		
(b). Mild	1	(b). Mild limitation	1		
(c). Obvious	0	(c). Obviously limited	0		
iii. Dyskinesia		vii. Walking			
(a). Normal (muscle strength grade 5)	2	(a). Normal	2		
(b). Mild weakness (muscle strength grade 4)	1	(b). Mild limitation	1		
(c). Obvious weakness (muscle strength 0 - 3)	0	(c). Obviously limited	0		

Table 3. Traditional Chinese medicine (TCM) syndrome score.

Categories	Score (points)	Categories	Score (points)
I. Lumbocrural tingling		IV. Tongue dark purple or ecchymosis	
(a). No	0	(a). No	0
(b). Mild	1	(b). Mild	1
(c). Moderate	2	(c). Moderate	2
(d). Severe	3	(d). Severe	3
II. Waist stiffness		V. Pulse astringent or string	
(a). No	0	(a). No	0
(b). Mild	1	(b). Mild	1
(c). Moderate	2	(c). Moderate	2
(d). Severe	3	(d). Severe	3
III. Limited activity			
(a). No	0		
(b). Mild	1		
(c). Moderate	2		
(d). Severe	3		

2.5. Efficacy Criteria

According to the "Chinese medicine rehabilitation clinical practice guidelines·low back pain (lumbar disc herniation)" [6], the clinical efficacy is divided into four levels: 1) Cured, lumbocrural tingling disappeared, lumbar function returned to normal, and TCM syndrome score decreased by ≥95%; 2) Markedly effective, lumbocrural tingling was significantly improved, lumbar function tended to be normal, and TCM syndrome score decreased by ≥70%; 3) Effective, lumbocrural tingling has improved, waist activity is slightly limited, and TCM syndrome score decreased by ≥30%; and 4) Ineffective: lumbocrural tingling was obvious or aggravated, waist activity was limited, and TCM syndrome score decreased by <30%.

2.6. Statistical Methods

SPSS 24.00 software was used for statistical analysis. Measurement data were expressed as ($\overline{x} \pm s$), in line with the normal distribution, using t-test for analysis; variables that did not show normal distribution are compared by non-parametric tests. Enumeration data were expressed as [n (%)], using χ^2-test. P-values < 0.05 indicated statistical significance.

3. Results

3.1. Comparison of VAS Scores between the Two Groups before and after Treatment

After treatment, the VAS scores of the two groups were lower than those before

treatment ($P < 0.05$), and those in the observation group were significantly lower than those in the control group ($P < 0.05$; Figure 2).

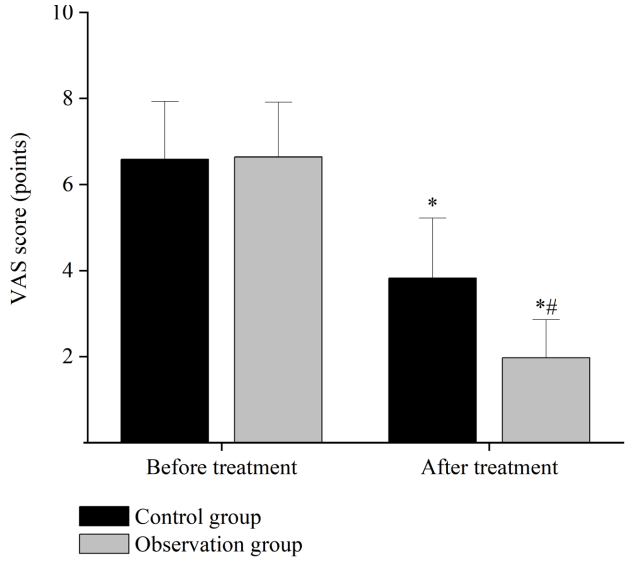


Figure 2. Comparison of VAS scores between the two groups before and after treatment ($\overline{x} \pm s$, points). Compared with before treatment, $^{*}P < 0.05$; compared with the control group, $\#P < 0.05$.

3.2. Comparison of JOA Scores between the Two Groups before and after Treatment

After treatment, the JOA scores of the two groups were higher than those before treatment ($P < 0.05$), and those in the observation group were significantly higher than those in the control group ($P < 0.05$; Figure 3).

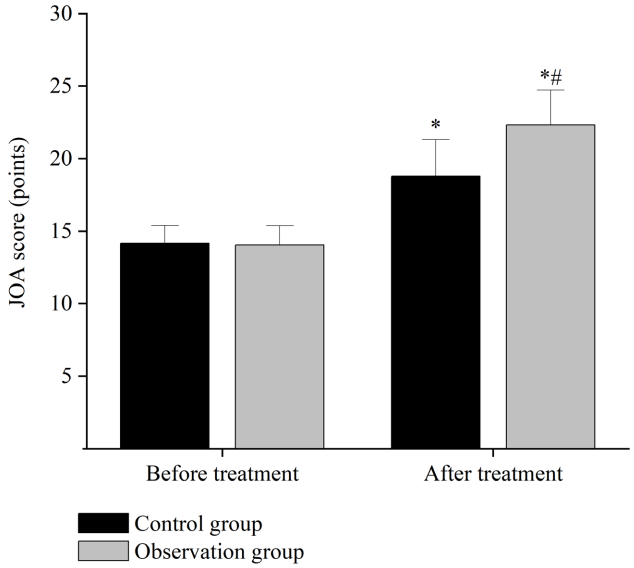


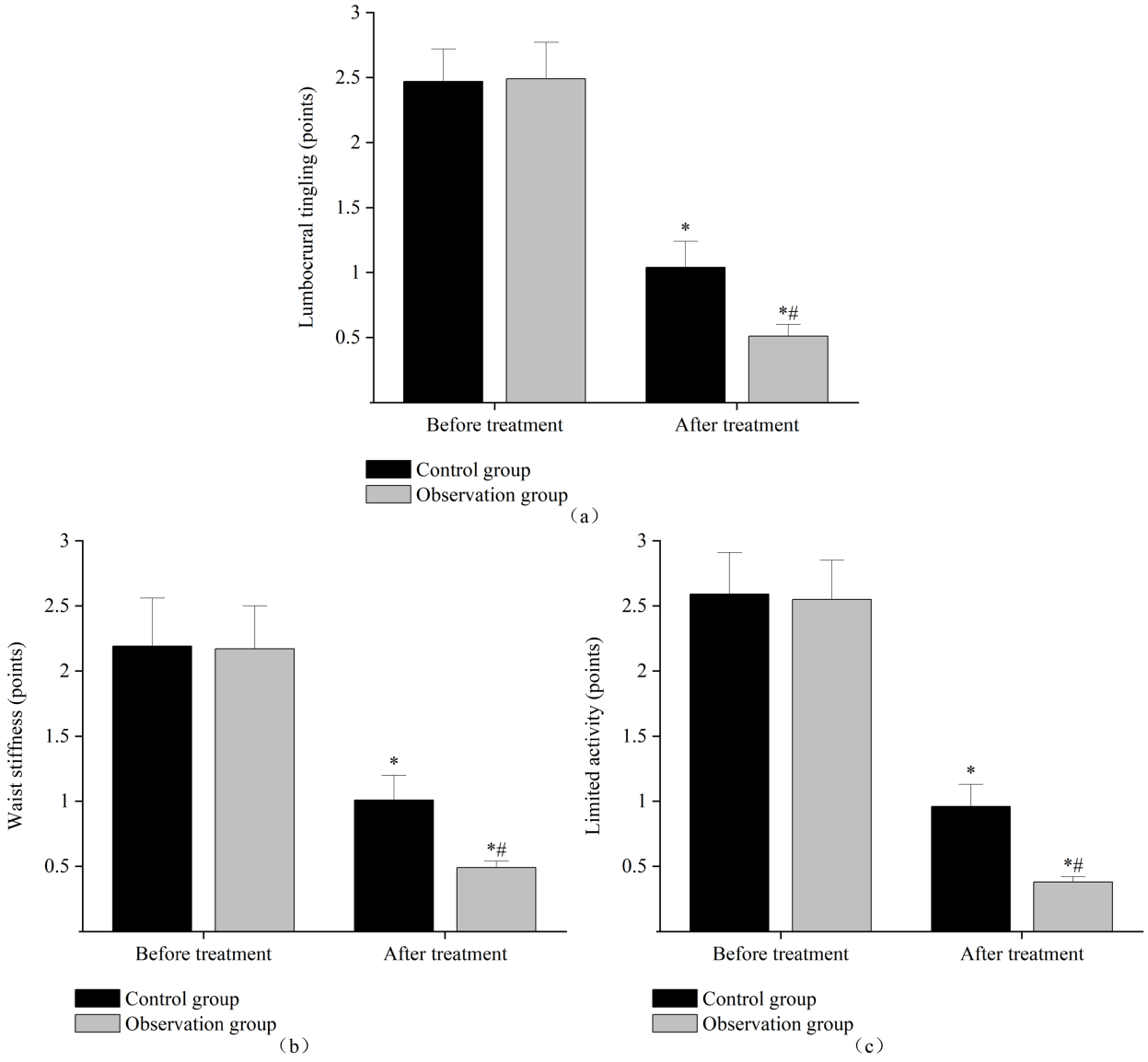
Figure 3. Comparison of JOA scores between the two groups before and after treatment ($\overline{x} \pm s$, points). Compared with before treatment, $^{*}P < 0.05$; compared with the control group, $\#P < 0.05$.

3.3. Comparison of TCM Syndrome Scores between the Two Groups before and after Treatment

After treatment, the scores of TCM symptoms, such as lumbocrural tingling, waist stiffness, limited activity, tongue dark purple or ecchymosis, and pulse astringent or string in the two groups were significantly lower than those before treatment ($P < 0.05$), and those in the observation group were significantly lower than those in the control group after treatment ($P < 0.05$; Figure 4).

3.4. Comparison of Serum IL-6, IL-1β, and TNF-α Levels between the Two Groups before and after Treatment

After treatment, the levels of serum IL-6, IL-1β, and TNF-α in the two groups were significantly lower than those before treatment ($P < 0.05$), and those in the observation group were significantly lower than those in the control group after treatment ($P < 0.05$; Figure 5).



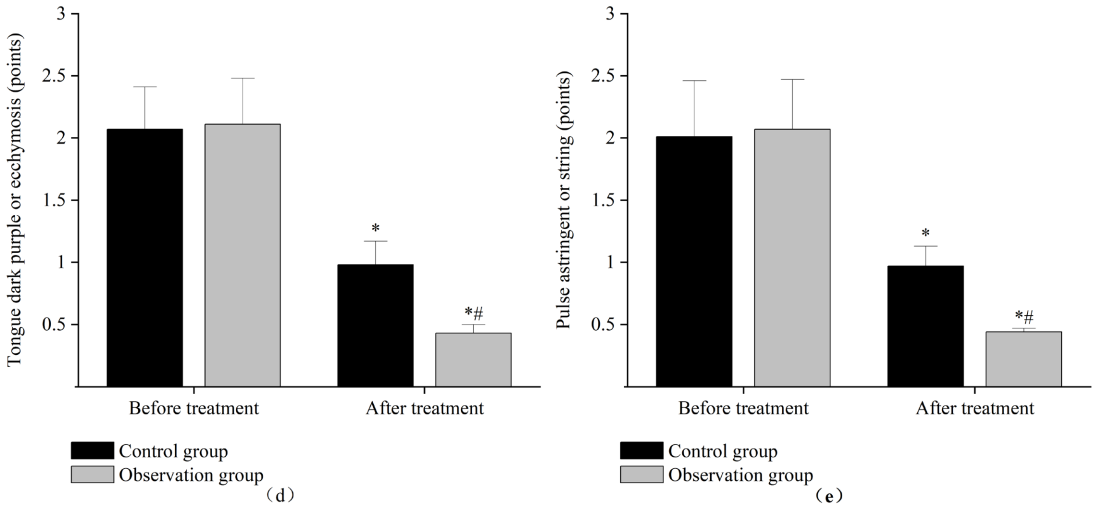


Figure 4. Comparison of TCM syndrome scores between the two groups before and after treatment ($\bar{x} \pm s$, points). (a) Lumbocrural tingling. (b) Waist stiffness. (c) Limited activity. (d) Tongue dark purple or ecchymosis. (e) Pulse astringent or string. Compared with before treatment, $^{*}P < 0.05$; compared with the control group, $\#P < 0.05$.

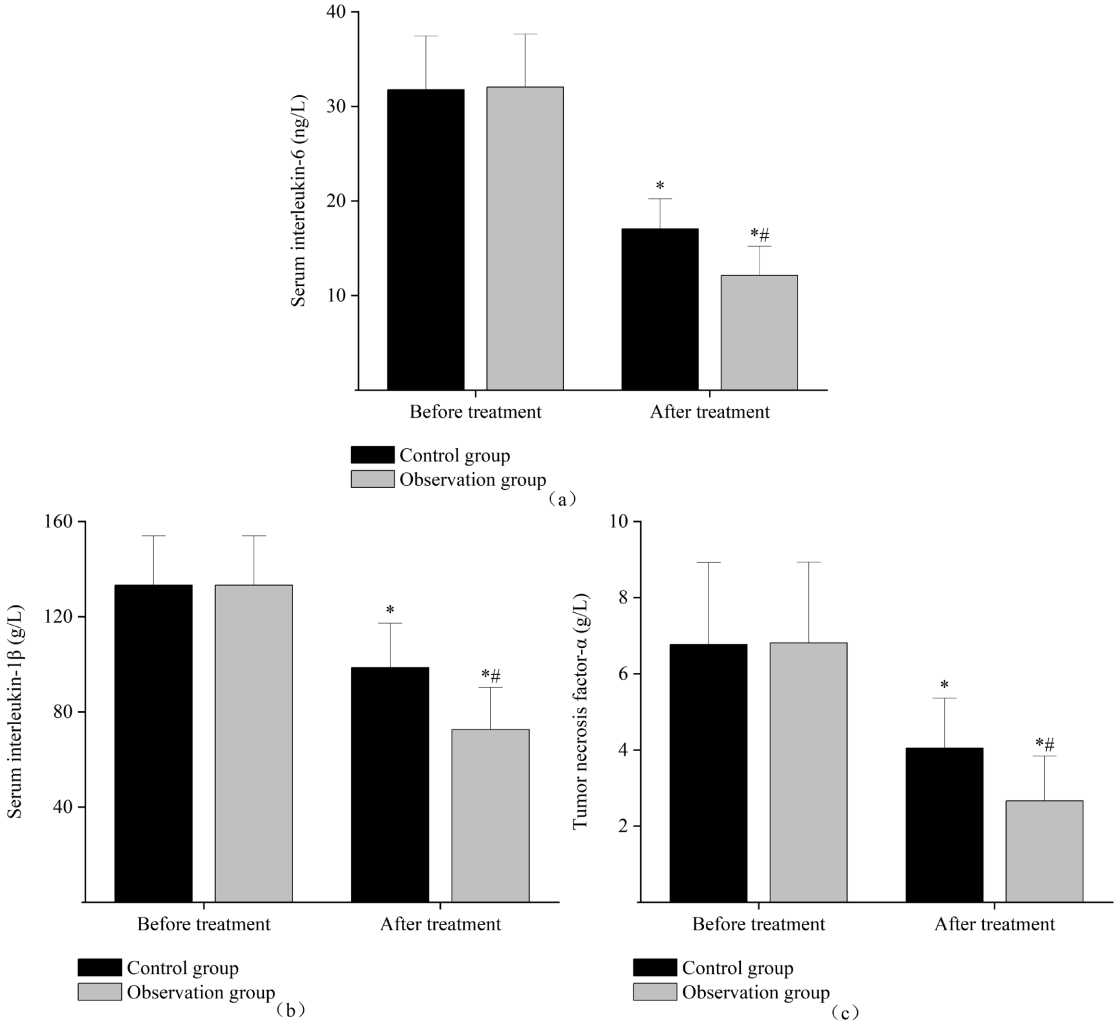


Figure 5. Comparison of serum IL-6, IL-1β, and TNF-α levels between the two groups before and after treatment ($\bar{x} \pm s$). (a) IL-6. (b) IL-1β. (c) TNF-α. Compared with before treatment, $^{*}P < 0.05$; compared with the control group, $\#P < 0.05$.

3.5. Comparison of Clinical Efficacy between the Two Groups

After two weeks of treatment, the total effective rate of the observation group was 93.02% (40/43) and that of the control group was 72.09% (31/43) ($P < 0.05$; Table 4).

Table 4. Comparison of clinical efficacy between the two groups [n (%)].

Group	n	Cured	Markedly effective	Effective	Ineffective	Total effective
Control group	43	16 (37.21)	11 (25.58)	4 (9.30)	12 (27.91)	31 (72.09)
Observation group	43	21 (48.84)	13 (30.23)	6 (13.95)	3 (6.98)	40 (93.02)#
χ^2						6.541
P						0.011

Note: Compared with the control group, #$P = 0.011 < 0.05$.

4. Discussion

Lumbar disc herniation belongs to the category of "lumbocrural pain", "low back pain", and "flaccidity syndrome" in traditional Chinese medicine. Clinically, it is mostly differentiated as qi stagnation and blood stasis, liver and kidney deficiency, wind-cold-dampness stagnation, and damp-heat accumulation; of these, qi stagnation and blood stasis are the most common [8]. Jing Yue's book, low back pain records, it is stated that "in the case of a fall injury and low back pain, this injury is in the bones and blood vessels stagnate". Blood stasis and impassability, impassability is pain. Therefore, in the choice of treatment, it is often necessary to promote blood circulation, remove blood stasis, promote qi, and relieve pain.

The TCM treatment of lumbocrural pain recorded in ancient books is often based on "coating" and "ironing", or external application of drugs via hot compress. The hot and humid compress originates from the TCM ironing therapy, and is the most commonly used external treatment in TCM that embodies the methods of promoting blood circulation and removing blood stasis [9]. The hot and humid compress therapy of TCM promotes qi, dredges collaterals, and relieves pain through the effect of warm heat and local penetration of traditional Chinese medicine [10]-[12]. The Radix Aconiti Preparata, Radic Aconiti Kusnezoffii Preparata, and Caulis Piperis Kadsurae (Guangxi), in the prescription, have the effects of expelling wind and removing dampness, dredging meridians, and relieving pain. Safflower and Caulis Spatholobi can promote blood circulation, disperse stasis, and relieve pain. Radix Zanthoxyli relieves qi pain and blood stasis; Vinegar Frankincense, Vinegar Myrrh, and Turmeric promote blood circulation, relieve pain, reduce swelling, and promote muscle growth. Rhizoma Sparganii and Rhioxma Curcumae Aeruginosae can be used for qi and relieving pain. Ginger Processed Pinellia and Arisaema Cum Bile can detumescence scattered knots. Cortex Erythrinae Seu Kalopanacis and Rhizoma Homalomenae can soothe tendons, activate collaterals, relieve pain and detumescence, and strengthen ten-

dons and bones. Radix Angelicae Dahuricae, Ramulus Cinnamomi, and Radix Saposhnikoviae can warm yang qi. Rortex Phellodendri and Fructus Gardeniae can relieve swelling and pain. Promoting blood circulation, removing blood stasis, promoting qi, and relieving pain can significantly improve the symptoms of LDH and help patients recover.

Modern medicine shows that the warm effect of TCM hot and humid compress therapy can expand local blood vessels, promote metabolism, activate the function of mononuclear macrophages, improve the body's immunity, and promote the rehabilitation of lumbar spine function [13] [14]. Chinese medicine ingredients penetrate into the subcutaneous tissue through the warm effect, which can accelerate the absorption of pain mediators and inflammatory factors and relieve pain [15] [16]. In addition, TCM components can also promote the reabsorption of the herniated nucleus pulposus of LDH, eliminate the compression and stimulation of nerve roots, and relieve clinical symptoms [17]-[19]. The results of this study show that the clinical efficacy of TCM hot and humid compress in the treatment of LDH is significantly higher than that of conventional clinical treatment. Compared with conventional clinical treatment, the VAS score, TCM symptom score, and inflammatory factor level of patients after treatment decreased, and the JOA score increased; this could improve the quality of life of patients.

However, this study still has some limitations. For example, only the short-term efficacy was evaluated, and the observation indicators were relatively limited, which could not verify the long-term effect and mechanism of the therapy.

5. Conclusion

In summary, the hot and humid compress of TCM can effectively relieve pain, restore lumbar function, improve TCM syndromes, reduce the level of inflammatory factors, and have a curative effect. This provides a reliable basis for the clinical treatment of LDH with TCM hot and humid compress.

Data Availability

All data generated or analyzed during this study are included in this published article.

Authors' Contributions

Conceptualization: Kui Xu. Data curation: Hailin Song, Hong Zhu and Zengwu Xu. Formal analysis: Hailin Song and Peng Li. Funding acquisition: Kui Xu. Resources: Kui Xu, Hong Zhu and Hailin Song. Software: Hailin Song and Runkai Wang. Writing—original draft: Hailin Song. Writing—review & editing: Kui Xu and Hailin Song.

Acknowledgements

The authors would like to thank all the members of the Department of Ortho-

pedics, Fangchenggang Hospital Affiliated with Guangxi University of Chinese Medicine for their great help and support.

Funding

This work was supported by funding supporters (the Key R&D Project of Fangchenggang City, No. Fangchenggang AB21014043).

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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