

Research Status and Prospects of Traditional Chinese Medicine in the Treatment of Lumbar Intervertebral Disc Herniation

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Abstract: Lumbar disc herniation (LDH) is a common lumbar disease that manifests itself as low back pain, leg numbness, and in severe cases, cauda equina neuropathy, and it often occurs in L4/L5 and L5/S1 intervertebral discs. With the continuous change of people's work and lifestyle, the number of patients with lumbar intervertebral disc herniation has also gradually increased, and there is a significant trend of rejuvenation. The disease is mainly divided into conservative treatment and surgical treatment, the vast majority of patients after conservative treatment of lumbar symptoms have been significantly relieved, Chinese medicine in the treatment of lumbar intervertebral disc herniation has the exact efficacy, more and more patients choose Chinese medicine conservative treatment. In this article, the relevant literature on Chinese medicine treatment of lumbar disc herniation in recent years is researched and collated, with a view to providing references and insights for clinical Chinese medicine treatment of lumbar disc herniation.

Keywords: Lumbar intervertebral herniation, Chinese medicine treatment, Paralysis, Low back pain.

1. Introduction

Lumbar disc herniation (LDH) is a type of cauda equina neuropathy caused by the rupture of the fibrous annulus, protrusion of the nucleus pulposus, irritation or compression of the nerve root. This condition leads to symptoms such as low back pain, leg numbness, sciatica, sensory deficits in the lower limbs, and even numbness in the saddle area, along with dysfunction of urinary and faecal functions [1]. And the disease is characterized by acute onset, recurrence, and prolonged duration, significantly impacting people's quality of life [2]. The disease is the primary approach, and Chinese medicine offers diverse treatment options with better therapeutic effects and no obvious trauma and other characteristics [3]. At present, the main TCM treatments for LDH include internal administration of traditional Chinese medicine, external treatment, acupuncture, moxibustion, small-needle knife therapy, tui-na, and traditional Chinese medicine guiding techniques. Recent research on TCM treatments for LDH is summarized below.

2. Traditional Chinese Medicine Formula

Chinese medicine compounds have significant advantages in treating LDH due to their affordability, simplicity, effectiveness, and minimal side effects, making them widely favored by patients. With the rapid advancement of traditional Chinese medicine and the pharmacological analysis mechanism, a scientific basis is provided, allowing for the further expansion of the benefits of traditional Chinese medicine compounds. Zhang Jiren [4] divided 130 wind-cold paralysis-type LDH patients into experimental and control groups. The experimental group received in-hospital treatment focusing on warming the meridians and strengthening the waist. The results indicated that the effectiveness rate of the experimental group was 98.46%, significantly higher than the control group's rate of 80.00%, further validating the efficacy of traditional Chinese medicine

compounds. Chen Xuping [5] utilized Duozhu parasitic soup in treating LDH and conducted a 6-month follow-up. The study revealed a notable alleviation of pain symptoms in the lower back and legs, substantial improvement in the functional mobility of the lumbar vertebrae. Modern medicine suggests that Duozhu parasitic soup enhances blood circulation, promotes new cell metabolism, and reduces the release of inflammatory factors, thereby alleviating patient pain and enhancing lumbar vertebrae function. In addition, Zhang Jialin et al [6] found that total saponin of hyssop (ABS), the main component of hyssop in Dokou parasitic soup, has anti-inflammatory, anti-apoptotic, and chondrocyte-protective effects, which alleviate lumbar spine pathology to improve the symptoms of lumbar pain. Based on modern pharmacological research, Wang Gongzhi et al. [7] found that tonifying the kidney, activating blood, and promoting the passage of the governor soup can effectively reduce TNF- α and IL-1 β inflammatory factor levels, decrease the damage of inflammatory factors to the nerve roots, enhance blood circulation, and effectively reduce pain levels in patients. This process also improves the function of the lumbar spine and enhances the quality of life. After modern medical research on the treatment of LDH, the tonic yang and return five soup can improve the local damage microenvironment, promote cell fiber regeneration, accelerate the repair of damaged nerves, and effectively treat the symptoms of nerve root compression [8]. In conclusion, Chinese medicine compounds can alleviate the clinical symptoms of lumbar disc herniation, enhance patients' quality of life, and show no obvious adverse reactions, making them suitable for clinical application and promotion. However, the mechanism of Chinese medicine compounds is complex and variable, and current pharmacological research is limited to the superposition of the effective components of single traditional Chinese medicines. This limitation fails to explain the mechanism of the combination of changes in the future. Therefore, there is a need to strengthen research on the overall formula of Chinese medicine compounds to make it more convincing in clinical practice. In the future, research on the overall formula of TCM

compounding should be intensified to enhance its credibility in clinical practice.

3. Acupuncture Treatment

Acupuncture improves various bodily functions by adjusting the changes of qi, blood, yin and yang in the meridians and internal organs, and has the effect of enhancing blood circulation, promoting the metabolism of inflammatory factors, and relieving the pain caused by LDH [9]. Acupuncture is now widely used in more than 200 countries and regions [10]. Zhang Yanzhen [11] added moxa pillars on top of acupuncture, which can accelerate the propagation of needle sensation when acupuncture stimulates qi under the effect of heat. This process stimulates cell metabolism, accelerates the absorption of inflammatory factors, and relieves pain. Warm acupuncture was used by Zhang Yanzhen to treat cold-damp paralysis-type LDH. She found that it could reduce the levels of IL-1 β , TNF- α , and β -EP, alleviate pain symptoms, and improve lumbar spine function. Wang Lei et al. [12], based on the theory of "soft tendons and bones, neck and lumbar treatment, increased the number of dorsal yu points in addition to the conventional acupuncture points (bilateral Fengchi, cervical Bairo, Tianzhu, and Ahshi points) for acupuncture treatment. The overall effective rate of the treatment group reached 95.0%, with no adverse reactions. This indicates that the selection of acupuncture points based on the theory of "soft tendons and bones, neck and lumbar treatment" can alleviate pain symptoms and improve the function of the lumbar vertebrae. Gao Yan et al. [13] divided 120 LDH patients into 2 groups. The treatment group applied the "Lingnan Chen's needle method" (main points: lumbar section of the Huatuo pinch ridge, ring jumps, commission in the middle) with the meridian guiding qi maneuver to enhance the needle qi conduction. The results showed that the "Lingnan Chen's needle method" effectively treated LDH symptoms and signs without any adverse reactions. The results indicated that "Lingnan Chen's Acupuncture" has better clinical efficacy in treating LDH symptoms and signs, VAS scores, and improving waist and leg functions, thereby enhancing patient compliance. Yang Wenxue et al. [14] utilized electroacupuncture combined with abdominal acupuncture to address pain and dysfunction in LDH patients. The results indicated that the JOA score, VAS score, and Oswestry dysfunction index were significantly better than those of the control group. This suggests that the combination of abdominal acupuncture and electroacupuncture could effectively alleviate lumbar pain, enhance lumbar mobility, and partially restore lumbar function in patients. Overall, acupuncture proves to be an effective treatment for lumbar disc herniation with a low incidence of adverse events. It is considered the primary treatment option alongside oral drug therapy. However, there are several limitations, including the lack of modern medical mechanism data support, the subjective nature of efficacy evaluation, the absence of objective indicators for assessing short-term efficacy, and the lack of long-term follow-up to evaluate treatment efficacy over time.

4. Tuina Orthopedics

As one of the most important methods of external treatment in Chinese medicine, Tui Na Bone Setting, also known as

"pressing stilts, position in orthopedics and traumatology clinics. It involves using hand strength and skills to manipulate the human body in various directions, applying leverage principles to realign joints, and alleviate pain. Mou Chenglin et al. [15] observed the effectiveness of using the four-step dragon bone-setting method to treat lumbar curvature of LDH. The results indicated that this technique could alter the mechanical equilibrium of LDH, restore the original mechanical balance of intervertebral discs and spine, improve the lumbosacral angle and lumbar curvature, and return them to normal mechanics to maintain stability, thus alleviating clinical symptoms. Yang Chan et al. [16] utilized a tendon-sparing and rejuvenation technique to treat LDH, achieving a total effective rate of 93.33% post-treatment, significantly higher than the control group. This method was believed to not only clear the liver and spleen meridians in the anterior abdomen, the bladder meridian in the lumbar area, and the ducal meridian but also enhance the body's qi and blood circulation, balance yin and yang, relax lumbar and abdominal muscles, and adjust the upper and lower articular eminence gap to reduce pressure on the nerve root, thereby alleviating pain and restoring lumbar spine function. Yan Zhen et al. [17] applied spinal fine-tuning manipulation to treat LDH, resulting in better Oswestry, ODI, and Short Form for Health Survey (SF-36) scores in the experimental group compared to the control group, with no significant adverse reactions, ensuring safety in clinical application. Lin Zhigang et al. [18] used the Tui Na kneading method to simulate lumbar intervertebral disc herniation in a rat model. Through experiments, it was found that this manipulation had an analgesic effect on the rats. Modern research analysis revealed that this technique could inhibit the expression of NK1R in the rats' spinal cord dorsal horn and restore the function of field potential, effectively suppressing central sensitization and providing analgesic effects. This experiment provides an objective theoretical basis for the treatment of LDH by Tui Na orthopedic manipulation and offers data support in the mechanism and sample data research. In conclusion, the authors believe that Tui Na manipulation has a better auxiliary effect in the treatment of lumbar disc herniation. However, due to the different experiences, feelings, and strengths of the practitioners, it is not possible to establish a uniform standardization for the precise dosage like drugs. In the future, a good pathological model should be constructed based on the biological characteristics of lumbar curvature and mechanics to establish a unified, standardized, simple, effective, and reproducible manipulation program.

5. External Treatment with Traditional Chinese Medicine

The external treatment of traditional Chinese medicine involves using physical methods to apply drugs directly to the affected area. This method is known for its simplicity and effectiveness in treating diseases, particularly in the case of LDH. Yu Liya et al. [19] suggested that Chinese medicine ironing can reduce inflammation, minimize connective tissue formation, aid in nerve fiber recovery, and reduce scar tissue formation by enhancing blood circulation. They treated LDH patients with Chinese medicine ironing and observed significant pain relief and improved quality of life in the patients post-treatment. Wang et al. [20] utilized hot compresses to improve blood circulation and eliminate stasis,

resulting in a 96% effective rate in the observation group after 4 weeks. According to traditional Chinese medicine theory, rice vinegar and white wine can act as carriers to enhance drug penetration directly to the affected area. Modern pharmacological research has shown that traditional Chinese medicine hot compresses can dilate skin and blood vessels, enhance blood and lymphatic circulation, expedite drug delivery to the affected area, reduce nerve root inflammation and edema, enhance local metabolism and nutrition, and quickly alleviate pain. Li Aiqun [21] achieved a 96% total effective rate using traditional Chinese medicine fumigation to treat lumbar intervertebral disc herniation, significantly higher than the control group's 72%. Chinese medicine fumigation combines the synergistic effects of Chinese medicine and warmth to improve blood circulation, skin expansion, and direct drug delivery through the skin to the affected area, reducing inflammation and neural edema to alleviate pain and symptoms. External Chinese medicine treatment proves more effective in treating lumbar intervertebral disc herniation, as drug ions enter the body through the skin and diffuse through the bloodstream to avoid burdening the liver and gastrointestinal tract, enhancing safety. However, due to direct skin contact with the drug, a small number of individuals may experience allergic reactions such as skin itching. Therefore, external traditional Chinese medicine treatment in clinical practice adheres to the dialectical treatment theory, selecting medicines and formulas, and choosing appropriate external treatment methods based on individual constitution to ensure efficacy and safety.

6. Traditional Chinese Medicine Guiding Technique

Chinese medicine's guiding gong method has a long history, but very few people associate it with disease treatment. It is based on the meridians, internal organs, qi, blood, yin and yang theory. The body and respiration interact in a harmonious movement to achieve a balanced state. Some studies have shown that practicing guiding gong method properly can strengthen tendons and bones, enhance qi and blood circulation, nourish internal organs, improve core muscle strength, reduce muscle tension near the lumbar spine, correct spinal mechanics balance, alleviate nerve root compression, and relieve lumbar and leg pain [22]. Pan Xuejiao et al [23] observed the effectiveness of eight duanjin in treating LDH. The group practicing eight duanjin showed better VAS and JOA scores compared to the control group. Traditional Chinese medicine believes that eight duanjin's gentle and coherent movements can promote smooth circulation of qi and blood, delivering nutrients to the muscles of the waist and legs, easing muscle and bone tension, and promoting rehabilitation for neck, shoulder, waist, and leg pain. Liu Shuli et al [24] evaluated the efficacy of taijiquan on lumbar intervertebral disc herniation using lumbar spine function score and lower back pain as indicators. They divided patients into two groups: a control group receiving ordinary acupuncture and a treatment group practicing taijiquan in addition to acupuncture. Results showed that the treatment group had better JOA scores and lower back pain relief rates, confirming the effectiveness of taijiquan. Cui Yi [25] compared the therapeutic effects of Five Animal Play and conventional rehabilitation training on LDH patients. The Five Animal Play group showed better JOA and Barthel index

scores, along with reduced hospitalization days. Integrating Five Animal Play into rehabilitation training can enhance core muscle strength, improve lumbar stability and mobility, and enhance recovery and prognosis. At present, the Chinese medicine guiding gong method is widely used in the treatment of lumbar intervertebral disc herniation, showing significant efficacy. However, research on the treatment mechanism of this method is insufficient. The effectiveness of the treatment relies heavily on subjective evaluation due to large individual variability. In the future, it is essential to enhance research by integrating the guiding gong method with modern medical science and developing a tailored exercise prescription.

7. Needle Knife Therapy

The needle knife is based on anatomical positioning, combined with the meridian theory and modern physiology derived from the new technology of traditional Chinese medicine. It is a combination of modern surgical therapy and traditional Chinese medicine acupuncture therapy, symbolizing the continuous development and innovation of traditional Chinese medicine. Acupuncture can loosen the soft tissues of the lumbar region, improve local circulation, promote metabolism, accelerate intervertebral disc repair and regeneration, restore the normal anatomical structure of the human body, and achieve the purpose of relieving spasm, removing adhesion, and alleviating pain. Zhang Zhantao et al. [26] aimed to verify the clinical effect of the needle knife in LDH. The control group received conventional acupuncture treatment, while the observation group received acupuncture + small needle knife treatment. After 3 weeks of continuous treatment, the total effectiveness of the observation group reached 97.78%. An analysis showed that the needle knife can scrape and cut the superficial fascia of the tension area or the non-endogenous soft tissue support system, reduce tissue accumulation, stimulate nerve endings, and promote the release of opioid peptides to achieve analgesic purposes. Zhu Wenting et al. [27] performed needle knife therapy for LDH under ultrasound guidance, which is another innovation in needle knife therapy. Under ultrasound visualization, the depth of needle insertion, as well as the scope and degree of loosening, were observed in real-time and dynamically. This fully relieved neural compression due to the thickening of the joint capsule extruding into the vertebral canal, improved LDH symptoms, and avoided nerve and blood vessel injuries, thus enhancing safety. In conclusion, the author believes that needle knife treatment for LDH has a high auxiliary effect. However, compared with other Chinese medicine operations, the needle knife requires a larger incision. If the operator is not clear about the anatomical structure, there is a risk of damaging nerves and blood vessels, affecting safety and therapeutic efficacy. Therefore, it is essential for operators in the future to have a thorough understanding of the human body's structural anatomy. Medical units capable of doing so should opt for ultrasound-guided needle knife treatment to ensure the safety of medical procedures.

8. Combined Chinese Medicine Treatment

Although Chinese medicine offers various treatments for lumbar intervertebral disc herniation, simply relying on a single method may not achieve the desired results. Therefore, clinics often employ a combination of treatments to enhance

effectiveness. Cao Qingling et al. [28] utilized a combination of haematopoietic and blood-stasis-expelling soup with acupuncture to enhance the low back function of patients with LDH, reducing pain and improving mobility. The study suggests that acupuncture can enhance blood flow in the lumbar region, release muscle adhesions, and facilitate the absorption of inflammatory substances. Haematopoietic and blood-stasis-expelling soup provides analgesic, anti-inflammatory, and cell activity-improving effects. The synergy of these treatments can enhance lumbar extensor muscle group fatigue, muscle strength, reduce inflammation, and alleviate pain. Long Houren et al. [29] divided 80 LDH patients into two groups. The control group received massage traction treatment, while the treatment group received Dilongsan internally along with massage traction treatment. Results showed that the treatment group had an effective rate of 92.50% (37/40), significantly higher than the control group's 72.50% (29/40). Massage traction can improve small joint disorders, relieve lumbar muscle tension, release adhesions, alleviate pain, and restore function. Tui na traction can address small joint disorders, muscle tension, adhesions, intervertebral disc height, and nerve compression symptoms. Dilong San can enhance lumbar microcirculation, reduce serum inflammatory factors, eliminate nerve root edema, and provide analgesic effects. The combined therapy significantly improves lumbar spine function and alleviates clinical symptoms, demonstrating the superiority of integrated therapy over individual treatments, making it a valuable approach for clinical application.

9. Look Ahead

Chinese medicine is more effective and advantageous in treating this condition. However, there are several limitations. Currently, there are numerous Branches of Chinese Medicine, leading to a lack of standardization and consistency in clinical protocols. Clinical efficacy assessment is predominantly subjective and lacks substantial support from extensive data, large sample sizes, and evidence-based medical research. Moving forward, it is essential to enhance basic research to personalize the treatment of lumbar disc herniation, and to enhance the effectiveness and impact of Traditional Chinese Medicine (TCM) by analyzing TCM mechanisms, biological models, pharmacological studies, and cytology.

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