

Research Status and Future Prospects of Acupuncture and Moxibustion in the Treatment of Lumbar Disc Herniation

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Abstract: *With the increase in the incidence rate of lumbar disc herniation year by year, finding effective treatment has become one of the important directions of medical research. As an important part of traditional Chinese medicine, acupuncture and moxibustion show unique advantages and potential in the treatment of lumbar disc herniation. By collecting and sorting out the relevant literature on the treatment of lumbar disc herniation with acupuncture and moxibustion in recent years, this paper summarizes the characteristics of acupuncture and moxibustion in the clinical treatment of this disease, summarizes the latest research status of acupuncture and moxibustion in the treatment of lumbar disc herniation, and looks forward to its future development.*

Keywords: Lumbar disc herniation, Acupuncture and moxibustion treatment, Research status, Future outlook.

1. Introduction

Lumbar Disc Herniation (LDH) is a pathological condition of lumbar disc degeneration, in which external forces cause the fibrous ring of the intervertebral disc to rupture and the nucleus pulposus tissue to protrude, resulting in compression or stimulation of the spinal nerve roots. The main clinical manifestations [1] are pain, numbness, decreased muscle strength, and symptoms of the cauda equina in the lower back and lower limbs. It is a common and frequent disease [2,3]. In recent years, the incidence rate of this disease has increased annually. The survey shows that the annual prevalence rate of adult low back pain in China is 20.88%~29.88% [4]. Pregnancy, obesity, smoking, etc., are all inducing factors of LDH [5]. The global incidence rate of LDH is about 2% to 3%, which tends to occur in young and middle-aged people. The protrusion of L4/5 and L5/S1 segments of the lumbar spine remains at about 90% [6]. With changes in modern lifestyle, long-term unhealthy habits are an important factor in inducing this disease. For example, long hours of work and study at the desk have led to the occurrence of this disease not being limited to the seriously ill elderly. The age of onset is becoming younger, and the incidence rate is increasing annually. Repeated low back pain has brought psychological and mental burdens to patients and consumed a lot of medical resources. Therefore, finding effective treatment methods has become one of the important directions of medical research. Acupuncture and moxibustion treatment of LDH has gained clinical attention and promotion due to its obvious efficacy, fewer adverse reactions, low risk, and low price. The author conducted a new review on the treatment of lumbar disc herniation by acupuncture and moxibustion in recent years, aiming to provide a reference for the treatment of LDH by acupuncture and moxibustion.

2. Warm Acupuncture and Moxibustion

Acupuncture and moxibustion are used to improve or relieve the symptoms of low back pain in patients with low back pain disease. It has shown good efficacy in clinical use. The

combination of acupuncture and moxibustion, particularly warm acupuncture and moxibustion, has been a focus of research mainly centered on the area of moxibustion and its forms. The combination of acupuncture and moxibustion was first described in the Treatise on Typhoid Fever by Yu Sweet [7], who used to observe the therapeutic effect of warm acupuncture and moxibustion combined with tuina manipulation on LDH. The study found that the combined treatment group experienced higher pain relief and a lower recurrence rate at the end of the course, indicating a more pronounced therapeutic effect. Another study compared the efficacy of warm acupuncture with that of ordinary acupuncture and found that warm acupuncture provided better pain relief and maintained the analgesic effect for a longer period of time. Zhou et al. [8] used warm acupuncture combined with body pain and blood stasis soup to treat cold-congealed and blood-stasis-type LDH. They found that the combined treatment group showed significant improvements in the JOA and ODI scores after the intervention ($P < 0.01$). The level of serum β -endorphin was also higher than that of the control group, indicating an improvement in lumbar spine function with a more obvious therapeutic effect. Warm acupuncture can improve the function of the lumbar spine, and its therapeutic effect is remarkable. Li Jiangbo [9] team divided patients with lumbar disc herniation into two groups. The control group received oral medication, while the observation group underwent warm acupuncture. After 30 days of continuous treatment, the observation group experienced more significant pain relief and lower recurrence, demonstrating its effectiveness. Another research team compared warm acupuncture with simple needling and found that warm acupuncture had a more significant analgesic effect and longer-lasting pain relief. The clinical routine of moxa segment, moxa stick, moxa fleece moulding, moxibustion box, or alcohol cotton ball are several ways. A related study [10] concluded that the study of moxa segment moxibustion lacked the comparison of its diameter and year. Moxa stick moxibustion is convenient to control the time and temperature variables in the clinical trial, but it is time-consuming and labor-intensive to operate. The moxa fleece moulding is close to the prototype of the ancient

Chinese book, but the uncertainty of too many factors in the process of production and operation is not conducive to the standardization of the trial. Moxibustion box is still less relevant in studies. The heat conductivity of moxibustion boxes needs to be investigated with more clinical data, and the danger of cotton ball cauterization is high, so there are fewer clinical studies.

3. Balanced Needle Therapy

Balance needle therapy [11] is a new type of acupuncture method that is safe and simple, with the characteristics of rapid effect. Its therapeutic effect is exerted by needling specific reaction points on the body surface. Ma Zhihong and Bai Yu [12] divided the patients into the balance acupuncture group and the traditional body acupuncture group in order. By comparing the total effective rate and the Oswestry dysfunction index, it was finally concluded that the efficacy of the balance acupuncture therapy was better compared with traditional body acupuncture. Li Xia et al [13] selected 60 cases of LDH patients as the object of analysis. The treatment group used balanced needle therapy, while the control group used ordinary acupuncture. They observed the body pain status before and after treatment, recorded the clinical cure rate of the two groups, and concluded that balanced needle therapy can effectively reduce the pain status of the patients, improve the lumbar function, and the clinical efficacy of the treatment is remarkable. Wang Lili et al [14] explored the clinical efficacy of balanced acupuncture combined with buccal acupuncture in the treatment of LDH and its improvement of patients' quality of life. They found that after treatment, the total effective rate of the combined treatment group was significantly better than that of the monotherapy group ($P<0.05$). The ODI score, the subjective pain score, and the JOA score improved significantly after intervention ($P<0.05$). The lower limb radiating pain score, the lumbar dorsal back muscle posterior extension ROM, the ODI score, and JOA score were significantly improved after the intervention ($P<0.05$). The radiating pain score of the lower limbs, the ROM of the posterior extension of the lumbar back muscles were significantly increased, and the positive rate of the straight-leg raising test was significantly reduced ($P<0.05$). This suggests that balanced acupuncture combined with buccal acupuncture in the treatment of LDH has a better clinical efficacy compared with single-needle acupuncture treatment, and it can significantly improve the quality of life of patients.

4. Wrist and Ankle Needle Therapy

Wrist and ankle acupuncture [15] is a specialized acupuncture therapy developed based on experience in treating neurological disorders. Gao Juan and Jiang Gufen [16] used conventional drug-based pain relief intervention as the control group, while the observation group received additional wrist and ankle acupuncture therapy. The comparison revealed that there was no statistically significant difference between the two time points 12 and 24 hours before and after treatment. However, there was a statistically significant difference after 3, 5, 7, and 10 days, indicating that the benefits of wrist and ankle acupuncture therapy increased over time. By comparing various observational indexes, it was concluded that wrist and ankle acupuncture therapy played a crucial role in the

recovery of dysfunction and neurological function. Overall, wrist and ankle acupuncture therapy is believed to be significant in improving dysfunction and neurological function recovery.

5. Fire Needling

Fire needling is a technique that involves rapidly piercing the tip of a red-hot needle into an acupuncture point to address a disease. Bai Jie [17] utilized fire needle acupuncture on kidney yu, large intestine yu, and clip spine points. This method combines warming and dispersing knots with stimulating the meridian qi to treat the disease. The results indicated that in a group of 50 patients treated with fire needling, the effectiveness rate was 93.75%, which was higher than the 78.72% rate in the ordinary acupuncture group. The comparison between the two groups showed a statistically significant difference ($P<0.05$). Wang Cheng et al. [18] employed milli-fire needles, heating the needle body red and swiftly inserting it into acupoints. The needles were placed in the waist, back, and buttocks at "tendon knot" points to warm the kidneys, disperse cold, and relax tendons. The results revealed that the visual analogue scale (VAS) scores of 35 patients in the treatment group were significantly lower than those in the control group, with a statistically significant difference ($P<0.05$). Zhang Dawei et al. [19] combined manipulative bone-setting with fire acupuncture at the lumbar pinch point to treat 180 patients diagnosed with LDH. The total effective rate in the treatment group was 95%, compared to 80% in the observation group, showing a statistically significant difference ($P<0.05$). Du Xin et al. [20] concluded, through a comprehensive review of literature, that fire needle therapy in treating LDH patients has various beneficial effects. These effects include adjusting the body's pain-sensing system, enhancing blood rheology and circulation, improving the regulation of the cerebral cortex, promoting nerve repair and neuroprotection, and providing anti-inflammatory, anti-emphysema, and anti-allergic effects. Overall, fire needling can effectively alleviate pain and enhance the quality of life for patients undergoing treatment.

6. Silver Needle

Silver needles contain up to 80% silver, which is effective in treating lumbar spondylosis due to its strong thermal conductivity, good sterilization, and strong stimulation compared to ordinary millimeter needles. Zhang Junjie et al. [21] selected the L1-S1 pinch point and the first lateral line of the bladder meridian acupuncture points after local anesthesia and used silver needles for treatment. With warm acupuncture, they treated lumbar intervertebral disc herniation with blood stasis. The treatment group showed better effectiveness, long-term efficacy, and lower recurrence rates compared to the control group, with all differences being statistically significant ($P<0.05$).

7. Supervised Moxibustion

Moxibustion is a specialized external treatment on the spine corresponding to the skin, up to the large vertebrae point, down to the Changqiang point, using drug partition foam moxibustion. It is a unique external treatment for the spinal column, based on the use of special herbal medicine to

stimulate yang qi, dispel wind and cold, strengthen the bones, warm the meridians, tonify the kidneys, benefit the kidneys, and pass through the directional channels to alleviate pain. Zhang Lei et al. [22] used the non-foaming method of supervisory moxibustion on the L1-S1 segment of the spine along with small needle knife therapy for treating lumbar intervertebral disc protrusion of the liver and kidney deficiency type. The results showed that out of 36 patients in the observation group, the effective rate was 89.36%, significantly better than that of the control group (76.38%), with a statistically significant difference ($P<0.05$).

8. Bloodletting Therapy

Wan Chen is removed through the plum blossom needle, three-pronged needle, fire needle, disposable injection needle, and other instruments. The subcutaneous stasis points, stasis blockage of veins and veins are punctured, and blood stasis is discharged to treat long-term diseases and intractable paralysis. Wang Wenyan et al. [23] targeted lumbar one to lumbar five entrapment points for puncturing bloodletting and cupping along with acupuncture to address lumbar intervertebral disc herniation with stasis blood. The pain sensitivity value of substance P and prostaglandin E2 (PGE2) decreased, indicating the effectiveness of the treatment method. Xue Yanfeng [24] utilized the commissioning point to stab the venous blood circulation and bleed 300 mL to activate blood circulation, eliminate blood stasis, and move qi to relieve pain in treating lumbar intervertebral disc herniation with blood stasis. The results revealed that the evaluation of the efficacy of the patients in the study group was significantly higher than that of the control group. The pain score was notably lower, and the recurrence rate was significantly reduced in the study group compared to the control group, with all differences being statistically significant ($P<0.05$). Liu Yao et al. [25] targeted the commission in the middle, diaphragm Yu, kidney Yu, A is the point, and other three-pronged needle puncture bloodletting followed by fire cupping to treat this disease. The method was found to quickly improve the blood return of the lower limbs, alleviate the patient's pain symptoms, and achieve a total effective rate of 92% in the puncture and bloodletting group. The onset of action time in the puncture and cupping group differed significantly from the puncture and bloodletting group, with statistical significance ($P<0.05$). This suggests that the treatment of lumbar pain with blood stasis in the stabbing and cupping group has evident clinical efficacy, facilitating the patients' prompt recovery.

9. Needle Knife Therapy

Needle knife therapy is a novel approach to treating lumbar disc herniation, rooted in the traditional Chinese medicine theory of meridian and collateral theory. This method combines needling with medical devices to induce significant bioelectrical activities in local tissues through local stimulation. This process aims to alleviate adhesion, muscle spasm, and edema. Niu Shiji et al. [26] conducted a study dividing 80 patients with lumbar disc herniation into two groups of 40 cases each through random grouping. The control group received standard treatment, while the observation group underwent small needle knife treatment in addition. The study compared pain scores and JOA scores,

revealing a decrease in pain scores for both groups post-treatment. Notably, the pain scores of the observation group were lower than those of the control group ($P<0.05$), and the JOA scores of the observation group were significantly higher ($P<0.05$). Mo Longfei et al. [27] examined 60 patients with lumbar disc herniation treated with small needle knife therapy, showing a notably higher total effective rate in the experimental group compared to the control group at the end of the treatment course ($P<0.05$). Yan Zhenjie et al. [28] concluded from a study involving 120 acute lumbar intervertebral disc herniation patients treated with small needle knife therapy and massage that this treatment not only alleviates pain effectively but also demonstrates good clinical efficacy. Furthermore, it can effectively reduce the occurrence of complications, showing promising feasibility and high application value.

look ahead

10. Summary

In summary, acupuncture is a safe and effective treatment for lumbar disc herniation (LDH), with various methods including warm acupuncture, balanced acupuncture, wrist and ankle acupuncture, fire acupuncture, silver needles, governor moxibustion, bloodletting therapy, and needle knife therapy applicable to a wide range of evidence. It has little adverse effects, can rapidly relieve patients' symptoms, and can be used alone or in combination with other therapies. Acupuncture treatment, as one of the non-surgical therapies, has a long history. Although acupuncture shows promise in treating LDH, there are still many challenges and research gaps. Future studies should focus on the following aspects: 1) Standardized study design: Develop a unified acupuncture treatment protocol and standardized operating procedures to improve the reproducibility and comparability of study results. 2) Multi-center, large-sample randomized controlled trials: Further validate the clinical efficacy and safety of acupuncture treatment through multi-center, large-sample randomized controlled trials. 3) Mechanism research: Modern medicine indicates that the etiology of LDH is complex, with various causative factors including mood disorders in patients. Emotional disorders not only trigger and worsen the condition but also complicate diagnosis and impact treatment outcomes. Research on the molecular biological mechanism of acupuncture treatment for lumbar intervertebral disc herniation will be conducted to reveal its action at the nerve, immunity, and metabolism levels. 4) Integrative medicine: Establish an integrative medicine model for acupuncture treatment of lumbar disc herniation by combining modern medical imaging technology, molecular biology technology, and big data analysis.

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