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Research Progress on Acupuncture Treatment for Lumbar Muscle Strain

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Abstract: ***Lumbar muscle strain is a common clinical condition, and acupuncture plays a significant role in its treatment. This article provides a comprehensive overview of recent advances in acupuncture therapy for lumbar muscle strain, aiming to clarify the current state of clinical application. By examining the therapeutic methods employed in acupuncture treatment and integrating theoretical knowledge from traditional Chinese medicine (TCM), the study conducts an in-depth analysis of the TCM-based management of lumbar muscle strain. The findings offer new perspectives and directions for future research on the efficacy and mechanisms of acupuncture therapy.***

Keywords: Acupuncture, Lumbar muscle strain, Research progress.

1. Introduction

In recent years, the incidence of lumbar muscle fatigue has been steadily increasing, accompanied by a rising number of outpatient visits. It has become a common and frequently occurring disorder that significantly affects individuals' quality of life and work efficiency, imposing considerable physiological, psychological, and economic burdens. Notably, the onset age is trending younger, which has drawn growing public and clinical attention.

Traditional Chinese Medicine (TCM) offers various treatment modalities for lumbar disc-related conditions, among which acupuncture is the most prominent. Since ancient times, the therapeutic efficacy of acupuncture has been repeatedly validated, with a long-standing history and extensive documentation in classical texts. It is widely applied in clinical practice. The objective of this study is to observe and analyze the clinical efficacy of acupuncture in treating lumbar muscle strain, in order to assess its potential in improving patients' quality of life. The findings aim to provide a valuable reference for clinical practice and support the broader application of this therapeutic approach.

2. Current Research Status at Home and Abroad

Lumbar muscle strain is a common condition, typically characterized by lower back pain, recurrent episodes, and exacerbation after physical exertion. It is also referred to as "lumbodorsal myofascitis" [1]. Lumbar muscle strain is a major cause of lower back pain, marked by a prolonged course and high recurrence rate [2]. With the widespread use of computers and mobile phones, cases have increased due to sedentary lifestyles, prolonged standing, sustained desk work, and forward bending. There are two principal types of causes: dynamic and static [3]. The primary etiologies include unresolved acute injuries, chronic inflammatory responses, congenital lumbar deformities, and acquired trauma. Additional contributing factors include prolonged sitting or standing, improper lifting of heavy objects, and sustained abdominal loading during certain physical activities [4].

Clinicians diagnose lumbar muscle strain by identifying the etiology, pathogenesis, prescription principles, and acupuncture points [5], and then apply specific acupuncture techniques to administer treatment. From the perspective of modern medicine, acupuncture has several therapeutic effects, including analgesia, regulation of systemic physiological functions, and enhancement of immune and defense mechanisms. This disorder is primarily caused by prolonged mechanical stress on soft tissues such as muscles, ligaments, and fascia, often in conjunction with individual physiological traits, constitution, and endocrine factors. In Traditional Chinese Medicine (TCM), selecting appropriate acupoints based on syndrome differentiation can not only alleviate symptoms of lumbar muscle strain but also help prevent recurrence. In recent years, acupuncture has been widely used in the treatment of various types of lumbar muscle strain due to its notable efficacy, minimal side effects, broad range of indications, and operational convenience [6]. International researchers have also affirmed that acupuncture can correct imbalances caused by the accumulation of vascular risk factors. Unlike pharmacotherapy, acupuncture addresses both local symptoms and systemic dysfunctions. Studies on anti-shock mechanisms have further demonstrated that acupuncture exerts preventive effects primarily by modulating the nervous system and certain endocrine glands [7]. Therefore, this review aims to collect and summarize literature of high scientific value regarding the clinical efficacy of acupuncture in the treatment of lumbar muscle strain within the framework of Traditional Chinese Medicine.

3. Understanding of Lumbar Muscle Strain in Traditional Chinese Medicine

3.1 TCM Nomenclature of the Disease

Although the term "lumbar muscle strain" does not appear explicitly in classical Traditional Chinese Medicine (TCM) literature, numerous ancient texts contain relevant descriptions. The most frequently used terms include "lumbago", "pain along spinal column", and "heaviness in waist" [8]. From a symptomatic perspective, the condition falls under the category of painful obstruction syndrome,

while etiologically, it is classified as injury of tendon and muscle. Therefore, in clinical TCM practice, the condition is generally referred to as "lumbago". "Lumbago" is characterized by pain in the lower back and the bilateral lumbar regions. It is often induced by external pathogenic invasion, internal organ deficiency, or physical trauma such as falling, all of which can lead to impaired blood circulation in the lumbar area and insufficient nourishment of the local tissues. The pathogenesis of low back pain has been extensively discussed and elaborated in various classical TCM texts, reflecting a long history of clinical understanding.

3.2 Etiology and Pathogenesis

The condition of "low back pain" (yao tong) was first documented in the Huangdi Neijing (Yellow Emperor's Inner Canon) [9], which provided a detailed discussion on its etiology, pathogenesis, nature, affected regions, and treatment principles. It also laid the groundwork for a relatively complete TCM syndrome differentiation system. For instance, Lingshu recorded 33 relevant cases, and Suwen documented 54 cases, offering a comprehensive explanation of the disease from the perspective of the meridian theory, thereby establishing a solid foundation for clinical diagnosis and treatment in later generations [10]. In Yizong Bidu (Essential Readings from Medical Lineage) under the section "Low Back Pain," it is noted: "Neijing states that discomfort in the lumbar region governed by the Taiyang meridian is often caused by external invasion of the six pathogenic qi. Another saying holds that lumbar pain associated with the Kidney meridian is due to internal damage caused by excessive sexual activity." These classical interpretations clearly reveal that lumbar discomfort is closely related to both external pathogenic factors (e.g., wind, cold, dampness, heat, dryness, fire) and internal deficiencies or overexertion. In the Jingyue Quanshu (Complete Works of Jingyue), low back pain is also attributed to traumatic injuries: "Lumbar pain may result from falls, damaging the tendons and bones, and causing blood stasis." This emphasizes the role of physical trauma in the etiology of the condition. In summary, the causative factors of lumbar discomfort can be classified into three major categories: external invasion, internal injury, and physical trauma.

4. Mechanisms of Acupuncture Therapy

The fundamental principles of acupuncture in treating diseases are based on the regulation of Yin-Yang balance, meridian harmony, and the equilibrium of Qi and blood [11]. First, regulation of Yin and Yang: Imbalance between Yin and Yang can result in clinical manifestations such as Yin deficiency or internal cold. Acupuncture exerts a therapeutic effect by restoring the dynamic equilibrium described in TCM as "Yin Ping Yang Mi" (Yin is peaceful and Yang is conserved), thereby helping the body regain internal harmony. Second, harmonization of the meridians: According to the classical TCM saying, "pain arises when there is obstruction," meridian blockage is a fundamental cause of many types of pain. Acupuncture promotes the unblocking and regulation of Qi and blood within the meridians, thus alleviating stagnation and facilitating smoother circulation. Third, regulation of Qi and blood: Acupuncture can tonify Qi and replenish blood, promoting healthy blood circulation. This makes it effective in treating syndromes related to blood stasis or blood deficiency, which often lead to impaired Qi and blood flow.

5. Modern Advances in Acupuncture Treatment of Lumbar Muscle Strain

5.1 Acupuncture Therapy

5.1.1 Filiform Needle Technique

The therapeutic efficacy of acupuncture is well recognized and is considered a vital method in Traditional Chinese Medicine (TCM) for treating diseases. Yang Zhifeng et al. [12] employed a dynamic needling technique at the Houxi (SI3) point for the treatment of lumbar muscle strain. The specific procedure was as follows: a disposable sterile filiform needle was inserted at Houxi and obliquely advanced 4 cm toward the Hegu (LI4) point. After insertion, manual stimulation was performed until the "Deqi" sensation (a combination of soreness, numbness, distention, and pain) was achieved and radiated throughout the hand. Once Deqi was obtained, the needle was vigorously manipulated with lifting-thrusting and twirling motions exceeding 180 degrees for approximately 1 minute. During needling, patients remained standing and were instructed to perform lumbar flexion, extension, and lateral rotation exercises within their physiological limits to maximize the range of motion for about 5–10 minutes. Subsequently, the patient lay prone on a treatment table for conventional acupuncture. Selected acupoints included Weizhong (BL40), Dachangshu (BL25), Shenshu (BL23), and Pangguangshu (BL28), with even reinforcing-reducing needling techniques applied. After Deqi was achieved, the needles were retained for 30 minutes. Treatments were administered once every two days, with 10 sessions constituting one therapeutic course. Among 30 patients, 4 achieved complete recovery, 20 experienced significant improvement, and 5 showed moderate improvement, resulting in a total efficacy rate of 96.7%. These findings demonstrate that filiform needle acupuncture alone can yield remarkable clinical efficacy in the treatment of lumbar muscle strain.

5.1.2 Moxibustion

Moxibustion is known to promote blood circulation, relieve inflammation and pain, accelerate muscle recovery, and reduce discomfort [13]. Li Gang et al. [14] utilized an improved Fire Dragon moxibustion method on 48 patients over one treatment course, achieving a therapeutic efficacy rate of 95.8%. Zhang Tingting [15] divided 60 patients into two groups: one received acupuncture alone, and the other received moxibustion at the lumbar region (L1–S4) for 30–40 minutes, followed by acupuncture. After two treatment courses, the experimental group showed significantly better results than the control group in VAS, SC-FRI, and clinical symptom scores. Li Zhixing et al. [16] compared heat-sensitive moxibustion and suspended moxibustion in 60 patients and found that both significantly improved pain and function, with heat-sensitive moxibustion offering more sustained benefits. Chao Weiming [17] applied suspended moxibustion 3–5 cm above bilateral Shenshu (BL23), Dachangshu (BL25), and Pangguangshu (BL28) until erythema appeared, reporting marked relief of lumbar pain after three weeks. Yao Bing et al. [18] used medicated

partitioned moxibustion on 45 patients for four weeks, reporting notable improvements in lumbar function, inflammatory markers, blood viscosity, and TCM symptom scores, with a 93.3% efficacy rate. Chen Minjun et al. [19] compared medicated and ginger-separated moxibustion with moxa box therapy in 60 patients. Results showed that the former yielded a 76.7% cure rate, significantly higher than the 43.3% in the moxa box group. Despite methodological variations, moxibustion consistently demonstrated effective symptom relief in patients with lumbar muscle strain.

5.2 Acupuncture Combined with Bloodletting Therapy

Mo Kaiqi [20] treated 37 patients with chronic lumbar muscle strain using a combination of acupuncture and bloodletting at Ashi, Weizhong (BL40), Dachangshu (BL25), Shenshu (BL23), and Jiaji points. After treatment, 15 patients were cured, 20 significantly improved, and only 2 showed no improvement, yielding a 94.6% total efficacy rate. This illustrates the significant therapeutic value of integrating acupuncture with bloodletting therapy.

5.3 Acupuncture Combined with Cupping Therapy

Li Yongfang [21] investigated the effects of cupping after acupuncture at Huatuojiaji points in 30 patients. After standard disinfection, acupuncture was performed using disposable sterile needles, followed by fire cupping. Treatment was terminated when erythema, congestion, or ecchymosis appeared. Each patient received one treatment every three days, two sessions per course. After two courses, 20 patients were cured, and 10 improved, with a 100% response rate. The results suggest that combining cupping with acupuncture provides superior efficacy compared to acupuncture alone.

5.4 Acupuncture Combined with Floating Needle Therapy

Floating needle therapy offers advantages including minimal pain, high safety, rapid onset, and low treatment frequency [22]. This technique, applied to superficial layers, avoids complications such as needle breakage or retention [23]. Floating needles stimulate the superficial Qi and Wei Qi, enhancing the body's defense against external pathogens. In contrast, traditional acupuncture targets deeper levels to influence internal organs and meridians, focusing on Deqi sensations like soreness, numbness, distention, and pain [24]. When used together, floating needle and acupuncture provide a synergistic effect from superficial to deep levels, harmonizing Yin and Yang, regulating meridians, and relieving both primary and secondary symptoms. Clinical studies [25] indicate that floating needle insertion causes mild discomfort, which reduces patient anxiety and improves treatment compliance. Due to its sweeping action and broader influence area, floating needling pulls more tissue, rapidly alleviating pain, reducing joint adhesions, and enhancing treatment outcomes. Although acupuncture alone shows immediate analgesic effects, some patients report reduced relief after rest at home. Combining floating needling with acupuncture helps consolidate therapeutic effects and reduce relapse. Overall, floating needling is easy to perform, clinically versatile, and highly complementary to acupuncture. Acupuncture remains the first-line TCM therapy for lumbar muscle strain [26], and combining both methods can significantly enhance treatment efficacy and reduce recovery time.

5.5 Acupuncture Combined with Electroacupuncture Therapy

Electroacupuncture (EA) involves connecting the positive and negative terminals of an electrotherapy device to acupuncture needles, allowing for adjustable intensity and frequency of stimulation. Its advantages include standardized, quantifiable stimulation and reduced labor requirements, making it highly suitable for clinical use. Modern studies [27–30] demonstrate that EA regulates neurotransmitters such as 5-HT and NE, producing analgesic and neuroprotective effects. Previous research by this group showed that EA provides immediate and sustained analgesia, enhances serum Beta-Epiphilin and superoxide dismutase (SOD) levels, and boosts antioxidant capacity while reducing oxidative stress. EA also stimulates injured lumbar muscles and nerves, promoting local blood flow and accelerating metabolism, thereby facilitating faster neuromuscular recovery. Long-term EA application can influence both sensory and motor nerves, making it effective for treating paralysis, chronic pain, and musculoskeletal injuries. Jiang Shaowei [31] noted that lumbar strain often leads to fascial adhesions due to chronic imbalance. EA loosens these adhesions, improves nerve conduction, enhances blood circulation, and restores metabolic balance, thereby alleviating pain symptoms.

6. Conclusion

Lumbar muscle strain (LMS) is a prevalent chronic disorder with a rising incidence, causing significant physical, psychological, and economic burdens for patients and society. As a result, healthcare costs increase, and productivity declines. In recent years, acupuncture therapy has gained popularity among LMS patients. Research indicates that acupuncture offers significant benefits in both treatment and prevention, providing reliable pain relief with a low recurrence rate and minimal side effects. Given its safety and efficacy, acupuncture and its integrative approaches deserve broader clinical promotion and application.

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