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A Theoretical Exploration of Acupuncture for Non-Specific Low Back Pain Based on the Jingjin Theory

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Abstract: Non-specific low back pain (NLBP) is a common soft tissue injury in clinical practice, characterized by varying degrees of pain and discomfort in the lower back. Its etiology often lacks clear specificity. Patients exhibit dysfunction of the sinew channels, often accompanied by muscle stiffness, restricted mobility, and impaired quality of life. According to traditional Chinese medicine (TCM) theory, NLBP is classified as "sinew impediment" (Jin Bi), with its pathogenesis attributed to sinew channel dysregulation and impaired circulation of qi and blood. Sinew channels are responsible for "binding the bones and facilitating the joints," playing a crucial role in maintaining skeletal stability, joint mobility, and overall movement coordination. The sinew channels in the lower back are closely related to the six-foot meridians, providing a significant theoretical foundation for diagnosis and treatment. Guided by sinew channel theory, palpation techniques are used to precisely locate lesion points, primarily focusing on "sinew knots" along the sinew channel pathways. Sinew knots are typically characterized by localized tissue tension, hard nodules, or tender points. During diagnosis, analyzing the distribution characteristics and depth of lesion points helps define the extent and severity of the condition, laying the groundwork for developing personalized treatment plans. Acupuncture is one of the primary TCM interventions. By needling lesion points to stimulate sinew channels, it can unblock meridians, regulate qi and blood, and alleviate the "sinew impediment" condition. Precision is central to acupuncture practice, with careful adjustments to needle depth and angle to target the affected tissues effectively, thereby relieving pain and restoring function. The application of sinew channel theory not only provides a reliable basis for the diagnosis and treatment of NLBP but also offers new perspectives for addressing other sinew-related conditions. Clinical practice of precision acupuncture further validates the effectiveness of this theory, offering scientific support for advancing traditional TCM techniques and integrating them with modern medical approaches.

Keywords: Jingjin; Jin Bi Lesion Points; Non-specific Low Back Pain; Filiform Needle Acupuncture; Theoretical Foundation.

1. Introduction

Low back pain is a common condition characterized by pain between the lower ribs and the horizontal crease of the buttocks, falling within the category of symptomatic diseases. Patients typically experience unilateral or bilateral leg pain, and some cases may also present with neurological symptoms in the legs, such as numbness, tingling, or weakness. The onset of these symptoms severely affects patients' ability to perform normal activities and diminishes their quality of life [1]. Low back pain can be classified into two types: specific and non-specific. Non-specific low back pain (NLBP) refers to a condition where no clear specific cause or structural abnormality is identified, yet the patient experiences musculoskeletal pain and discomfort. NLBP accounts for as much as 85% of all low back pain cases, demonstrating its prevalence and complexity [2]. Epidemiological studies indicate that from 1990 to 2016, low back pain has become one of the top five leading causes of disability worldwide, highlighting the severity of its health burden [1]. In the United States, most people will experience at least one episode of back pain in their lifetime, with approximately a quarter of adults having experienced low back pain in the past three months [3]. In China, surveys targeting individuals aged 45 and older show a prevalence rate of 18.6% in this age group, with some regions reporting prevalence as high as 39%. This significant regional variation suggests that environmental factors, occupational characteristics, and the distribution of healthcare resources may influence the prevalence, further emphasizing the severity of low back pain as a public health issue [1]. Low back pain not only causes persistent physical pain and psychological stress for patients but also imposes a heavy economic burden on families and society. The long-term medical costs, reduced productivity, and increased caregiving expenses pose significant challenges to both family and societal economic development. As the global population grows and aging trends intensify, this burden will increase, compelling public health sectors to invest more in its prevention and treatment. In 2018, a special article published in *The Lancet* systematically analyzed the adverse physical, psychological, and social impacts of low back pain, calling for increased global attention to this issue. The article pointed out that existing evidence-based medical guidelines have limited applicability to low- and middle-income populations, whose access to healthcare resources is often insufficient, and there is a significant gap between evidence and practice [4]. Therefore, developing more universally applicable and cost-effective treatment strategies is an important issue that needs to be addressed in the future [5]. As the burden of low back pain intensifies, the healthcare system must strike a balance between treatment efficacy and economic costs. By promoting more efficient prevention and treatment methods, such as early intervention, physical rehabilitation, and precision medicine strategies, it is possible to alleviate patients' suffering and reduce the societal burden to some extent. Additionally, strengthening screening efforts for high-risk populations and promoting health education will help reduce the incidence of low back pain and improve patients' quality of life.

2. The Connotation of Traditional Jingjin Theory

In traditional Chinese medicine (TCM), NLBP is categorized under "Bi Syndrome" and "Low Back Pain," with its etiology being complex and multifactorial, primarily involving two major aspects: first, the invasion of external pathogens such as wind, cold, and dampness, which block the circulation of Qi and blood, causing a deficiency in nourishment of the meridians. Second, internal organ injury: Dysfunction of the internal organs leads to Qi and blood deficiency, which further results in malnutrition of the meridians. The basic pathogenesis lies in the obstruction of the meridians in the lower back and the stagnation of Qi and blood circulation, which leads to the lack of nourishment of muscles and tendons, resulting in symptoms such as back pain, stiffness, and other discomforts. The theory of the meridians originates from the *Ling Shu* (The Spiritual Pivot), which holds that the twelve meridians cover the body's joints and fascia, coordinating motor functions. The lower back is a crucial junction area for the twelve meridians, particularly the Foot Taiyang Bladder Meridian, which "converges in the buttocks and runs along the spine," directly affecting the structure of the lower back. The Foot Taiyang Meridian, along with the Foot Shaoyang, Foot Shaoyin, and Foot Yangming meridians, collectively cover the lower back area, forming a multi-layered protective and supportive network with bundles, sheets, planes, and membranes. This structure plays a critical role in the stability and motor function of the lower back. The invasion of wind, cold, and dampness, or prolonged strain, can lead to muscle contraction and stiffness, obstructing the circulation of Qi and blood, which gradually results in a state of "tightness" in the meridians. Under the continued influence of external pathogens, the Qi, blood, and bodily fluids in the lower back meridians become blocked, forming "horizontal networks." "Horizontal networks" are manifestations of abnormal tissues, including nodules, adhesions, and strands, which reflect malnutrition and pathological changes in the meridians [6]. Palpation reveals oval-shaped or cord-like nodules or masses along the meridian path in the lower back. These nodules are a direct reflection of pathological changes. The pressure on the Qi and blood circulation pathways at these lesion points exacerbates the obstruction and contraction of the meridians, leading to persistent lower back pain. Scholars such as Xue Ligong have pointed out that meridian injury is the fundamental cause of meridian blockage and pain. This theory provides a clear pathological mechanism for the diagnosis and treatment of NLBP in TCM. The theory of the meridians emphasizes the importance of smooth Qi and blood flow, providing a guiding framework for diagnosing and treating meridian disorders through palpation and therapies such as acupuncture and tui na (Chinese therapeutic massage), with significant clinical application value.

3. The Connotation of Modern Jingjin Theory

Modern medicine has not yet reached a consensus on the pathogenesis of NLBP, but it is generally believed to be the result of a combination of various factors. These factors include: prolonged strain, poor posture, or improper movement habits leading to muscle dysfunction; degenerative changes that may cause structural imbalance and increase stress on the lower back; and uneven mechanical distribution that negatively affects the stability and function of the lower back, further triggering back pain [7]. Due to strain or prolonged poor posture, the muscles of the lower back are prone to imbalanced tension between the two sides. To maintain body balance and proper function, the healthy side muscles compensate for the damaged side, but this compensatory mechanism, over time, leads to excessive fatigue, ischemia, hypoxia, and metabolic disorders in the lower back muscle groups. Tension imbalance and compensatory effects collectively weaken the stability of the spine, becoming a key contributing factor to chronic lower back injuries. Under prolonged damage, the local neuromuscular junction function in the lower back muscles is lost, leading to continuous abnormal contraction of muscle fibers, forming what are known as myofascial pain trigger points. These trigger points are the primary source of back pain, as they are accompanied by the release of inflammatory mediators (such as prostaglandins and cytokines), further intensifying the pain response. At the same time, metabolic disorders cause the affected muscle fibers to lack recovery capacity, forming a vicious cycle. When back pain reaches a certain level, the damaged muscles go into spasm, further compressing and stimulating the spinal nerves. This neural stimulation intensifies the pain and may trigger a reflex defense mechanism in the lower back, causing muscles to tighten further, resulting in a continuous vicious cycle. The key to treating NLBP lies in releasing the contracted muscle bundles to alleviate the tension and inflammatory response of myofascial pain trigger points. By improving the tension balance of the lower back muscles, restoring normal metabolic function, and stabilizing the spine, the vicious cycle can be effectively broken, fundamentally addressing the pain issue. This treatment approach emphasizes precise intervention targeting muscle tissue, such as physical therapy, acupuncture, massage, or other muscle relaxation techniques, providing long-term pain relief and functional improvement for patients.

4. Jingjin Theory-Based Analysis of Acupuncture Treatment for NLBP

Meridian therapy can effectively restore the normal physiological function of the lower back by adjusting and releasing the pathological tension and compensatory states of the muscles. By improving muscle balance and stability, enhancing the strength and stability of the lower back, and preventing further damage caused by imbalanced or overly tense muscles, this therapy helps improve overall mobility and comfort. This treatment approach helps restore the correct physiological position of the spine and pelvis, further improving the health status of the lower back. The primary pathogenesis of specific low back pain lies in "transverse stagnation," where certain areas of the meridian or fascia become compressed due to prolonged tension or injury, resulting in localized pressure. This compression can lead to poor local blood circulation, nerve compression, and subsequently cause pain, stiffness, or functional impairment. The core of the treatment is "dissolving the knot," which involves using various methods to relieve this compression, restore local blood flow and nerve function, thereby reducing or eliminating pain and restoring normal lower back function. Acupuncture is a commonly used treatment method, based on the principle of "using pain as an acupuncture point," where needling is applied at the pain or lesion sites. The depth, angle,

and direction of acupuncture can be personalized according to palpation findings, helping activate the muscle's self-repair mechanism and improving muscle endurance and stability. Studies have shown that acupuncture can effectively relieve tension and spasms in the lower back muscles, promoting muscle relaxation and thereby achieving pain relief and functional restoration. Needle scalpel therapy involves cutting and releasing soft tissue at the lesion site to eliminate the compression or nodules caused by fascia, meridians, and other structures. Through precise cutting, it can effectively unblock the meridians that are compressed, restoring local blood circulation and nerve function, thereby relieving pain and muscle spasms. Especially in the meridian trigger points located in the lumbar-sacral region, cutting with a needle scalpel can significantly relieve the pressure at the lesion site, achieving better therapeutic effects [8]. Thermoacupuncture is a treatment that combines acupuncture and heat therapy. By applying acupuncture near the trigger points of specific muscle groups in the lower back (such as the quadratus lumborum, multifidus, and iliopsoas muscles), it uses local warmth to further relax the muscles and alleviate myofascial tension. Thermoacupuncture not only helps release muscle spasms and restore muscle elasticity but also improves muscle stability and endurance, reducing the recurrence rate [9]. Moxibustion with moxa sticks can effectively warm the meridian trigger points in the lower back, using the heat from the moxa to help relax the local muscles and fascia, promoting blood circulation and metabolism. Combined with core training, it strengthens the muscles around the lower back and spine, improving muscle strength and endurance, optimizing force distribution, and stabilizing the lower back both statically and dynamically. This comprehensive treatment method enhances muscle mass in the lower back, improves proprioception, reduces the load during movement, and effectively prevents the recurrence of back pain [10]. These treatment methods are highly targeted and personalized, and treatment plans can be adjusted based on the patient's specific condition and symptoms. After comprehensive treatment, they can significantly improve the function of the lower back, reduce pain, and enhance the quality of life.

5. Conclusion

As a common clinical condition, the occurrence and development of NLBP are closely related to the physiological and pathological changes in the meridian system. The meridian system in the human body is responsible for maintaining the normal movement of muscles, joints, and bones, particularly in the spine and lower back regions. When the meridian system undergoes pathological changes, such as fascia adhesions, tension imbalance, or compression phenomena, it often leads to pain and dysfunction in the lower back. Therefore, it is clinically significant to adopt targeted treatment methods based on meridian theory to intervene in these pathological changes. This treatment approach based on meridian theory can help relieve lower back pain, reduce muscle stiffness, and improve blood circulation by adjusting and restoring the normal function of the meridians, thereby improving the patient's quality of life. In recent years, treatment methods based on meridian theory, such as acupuncture, needle scalpel therapy, moxibustion, and tuina, have been widely applied in clinical practice with significant therapeutic effects. These treatment methods not only effectively relieve symptoms and pain but also improve the patient's mobility to some extent, enhance the stability and balance of the lower back, and reduce the recurrence rate of the condition. Research has shown that these methods can provide longer-lasting therapeutic effects by restoring the normal function of the meridians and resolving issues such as compression and adhesions caused by meridian dysfunction. However, despite the significant advantages of meridian theory in treating NLBP, current research into its mechanisms of action remains insufficiently explored. Future research should further explore and clarify the specific mechanisms of meridian theory in the treatment of NLBP, including its effects on muscles, fascia, nerves, and other tissues, as well as the indications and optimal treatment regimens for different therapeutic methods. By combining basic research with clinical practice, more scientific and systematic theoretical support can be provided for this field, promoting the application of more personalized and refined treatment methods to achieve more efficient, safer, and sustainable diagnostic and therapeutic outcomes.

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References

[1] Gu Rui, Wang Yan, Chen Bohua. Clinical Diagnosis and Treatment Guidelines for Non-specific Low Back Pain in China [J]. Chinese Journal of Spine and Spinal Cord, 2022, 32(03): 258-268.

[2] National Administration of Traditional Chinese Medicine. Issuance of the Traditional Chinese Medicine Industry Standard of the People's Republic of China: Diagnostic and Efficacy Standards for TCM Diseases and Syndromes [J]. Journal of TCM Administration, 1994(06): 2.

[3] Hayden J A, Wilson M N, Riley R D, et al. Individual recovery expectations and prognosis of outcomes in non-specific low back pain: prognostic factor review [J]. Cochrane Database of Systematic Reviews, 2019, 2019(11).

[4] Maher C, Underwood M, Buchbinder R. Non-specific low back pain [J]. Lancet, 2017, 389(10070): 736-747.

[5] Zaina F, Côté P, Cancelliere C, et al. A Systematic Review of Clinical Practice Guidelines for Persons with Non-specific Low Back Pain With and Without Radiculopathy: Identification of Best Evidence for Rehabilitation to Develop the WHO's Package of Interventions for Rehabilitation [J]. Archives of Physical Medicine and Rehabilitation, 2023, 104(11): 1913-1927.

[6] Li Guoqing, Tian Min, Zhang Yingjie, et al. Effects of Manual Therapy Combined with Core Muscle Training Based on Jingjin Theory on Pain and Lumbar Function in Patients with Chronic Non-specific Low Back Pain [J]. Chinese Folk Therapy, 2022, 30(22): 27-30.

[7] Ran Qingzhi, Li Aoshuang, Chen Hengwen, et al. Randomized Controlled Study on the Efficacy of Myofascial Release Therapy for Chronic Non-specific Low Back Pain [J]. Chinese General Practice, 2024, 27(20): 2451-2457.

[8] Li Shuwen, Tian Xiangdong, Zhu Guangyu, et al. Observation on the Efficacy of Acupotomy Combined with Core Stability Training of Lumbar Back Muscles in Treating Chronic Non-specific Low Back Pain [J]. Modern Journal of Integrated Traditional Chinese and Western Medicine, 2020, 29(13): 1401-1404.

[9] Zhou Chengen, Zhang Heng, Feng Qiang, et al. Clinical Study on Using Thermal Needles Based on Myofascial Trigger Point Technology to Treat Refractory Low Back Pain [J]. Clinical Research of Traditional Chinese Medicine, 2021, 13(30): 135-138.

[10] Cao Shuqi, Dong Baoqiang, Lin Xingxing, et al. Effects of Jingjin Moxibustion Combined with Core Stability Training on Pain, Function, and Muscle Endurance in Chronic Non-specific Low Back Pain [J]. Chinese Journal of Traditional Chinese Medicine, 2019, 37(04): 911-914.