

# ***Discussion on the Therapeutic Idea of Acupuncture in Treating Amyotrophic Lateral Sclerosis by Strengthening the Spleen and Tonifying the Kidneys***

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**Abstract:** The medical community has focused a lot of interest on amyotrophic lateral sclerosis, a rare disease, due to its dismal prognosis, rapid development, and unexplained causation. Muscle weakness, atrophy, and even paralysis are its primary clinical signs; in traditional Chinese medicine, these symptoms are comparable to "impotence". Therefore, many medical practitioners attribute it to the category of "impotence". Based on years of clinical experience, the Second Department of Brain Diseases at Xi'an Hospital of Traditional Chinese Medicine specializing in brain diseases posits that the pathogenesis of amyotrophic lateral sclerosis (ALS) is mainly attributed to deficiency of the spleen and kidney. Thus, the treatment is carried out from the perspective of the spleen - kidney theory. Acupuncture, one of the most crucial therapeutic methods in traditional Chinese medicine, boasts significant clinical value because of its efficacy and high safety. Therefore, taking acupuncture as the primary treatment method and focusing on invigorating the spleen and tonifying the kidneys to treat this disease offers a valuable approach for clinical practice.

## **1. Introduction**

Amyotrophic lateral sclerosis (ALS), a fatal CNS neuro-degenerative disease, can be difficult to recognise, especially in the early stages. The disease is rare, and more common illnesses are frequently considered before amyotrophic lateral sclerosis, delaying diagnosis [1]. There are 2 types of ALS, sALS and fALS, in terms of whether they are genetic or not [2]. Other factors associated with the development of ALS include genes, age, gender, environmental factors, and lifestyle habits. The pathogenesis of ALS is still unclear, and there is no exact etiology that can fully summarize the pathogenesis of ALS. So far, it is believed that the etiology of ALS may be related to the following mechanisms: gene mutation, misfolded protein aggregation, oxidative stress damage, mitochondrial dysfunction, glutamate excitotoxicity, axonal transport abnormality, neuroinflammation, and RNA metabolism abnormality, etc [3]. The clinical manifestations of ALS are mainly limb and extremity, and the symptoms of ALS are mainly the following: sALS and fALS [4]. Clinical manifestations are mainly muscle weakness and atrophy of the limbs and tongue muscles, and the condition gradually

aggravates to severe atrophy of the muscles in the middle and late stages of the disease, with difficulty in sound formation, salivation, choking, difficulty in swallowing, and ultimately death due to severe nutritional deficiencies or respiratory failure [4]. The worldwide all-age prevalence is 4.5 (4.1–5.0) per 100,000 people, and the all-age incidence is 0.78 per 100,000 person-years. The pathophysiology of ALS remains unknown, limiting the development of disease-modifying therapies [5]. Currently, the most commonly used drugs in clinical practice are riluzole and edaravone approved by the U. S. Food and Drug Administration, but these two drugs are expensive and only delay the progression of the disease, with obvious adverse effects and high prices, while there is a scarcity of other effective therapeutic drugs. Acupuncture, as a therapeutic modality of traditional medicine in the motherland, has been found to have some clinical efficacy in treating and delaying ALS through clinical practice.

## 2. The etiology of ALS

There is no name for ALS in traditional Chinese medicine, but according to the symptoms and course of ALS, it has been categorized as "impotence syndrome" by medical practitioners throughout the ages. Impotence is mainly characterized by sluggishness and weakness of the limbs and muscles, inability to move freely, or accompanied by muscle atrophy. The earliest description of the etiology and treatment of impotence can be found in the "Huangdi Neijing - Suwen" impotence theory chapter "the lungs of the body of the skin, the heart of the body of the blood, the liver of the body of the sinews, the spleen of the body of the muscle, the kidneys of the body of the bone marrow. Therefore, the lung is hot and anxious, the skin and hair are weak, anxious and thin, with the birth of impotence and crippling also", the main cause of impotence is categorized as the lung is hot and anxious, at the same time, impotence is divided into the skin, veins, sinews, muscles, flesh and bone five impotence, in order to indicate that there is a difference in severity and depth of the disease. In the treatment, the principle of "treating impotence only by taking Yangming" was proposed, that is, by strengthening the spleen and stomach to enrich the muscle volume and increase muscle strength [6]. And Chen Wou Zai "three causes of extreme disease certificate square theory - five impotence narrative" mentioned that "impotence crippled belongs to the five internal, dirty qi insufficiency is also". Jin Yuan and Zhang Zihé, the relevant theory in traditional Chinese medicine, emphasizes that impotence disease is not related to cold. It holds that the pathogenesis of impotence disease is "because the kidney water cannot overcome the heart fire, the heart fire flares up and affects the lung gold. The lung gold is controlled by the fire, the six leaves are burnt, the skin and hair become weak, and the body gets emaciated due to anxiety". Both of them believe that the pathogenesis of impotence is mainly related to the five internal organs, especially the kidney.

## 3. Theoretical basis of strengthening the spleen and tonifying the kidneys

The theoretical basis for treating ALS with the method of strengthening the spleen and nourishing the kidneys is detailed in the literature of traditional Chinese medicine, which indicates from various aspects the importance of the spleen and kidneys in both congenital and acquired development and the occurrence and progression of atrophy. The earliest mention can be found in the "Su Wen: On the Six Sections of the Zang Organs", where it states "The kidneys are the master of the essence, the foundation of storage, and the place of essence", and in the "Su Wen: On Atrophy", it says "The kidneys govern the marrow of the bones. If the kidney qi is hot, the waist and spine cannot lift, the bones wither and the marrow decreases, leading to bone atrophy". In the Ming Dynasty, Li Zhongzi in "Essential Reading for Medical Practitioners" also clearly stated that "the kidney is the foundation of the innate", believing that the kidney exists before other organs at the beginning of embryonic development and is the basis for human growth and development. The most common clinical manifestations of ALS are muscle weakness and muscle atrophy. However, these documents all point

out that the kidneys are the foundation of innate essence, storing essence, governing bone and marrow, and connecting marrow to the brain. When kidney essence is sufficient, bone marrow can be generated, and bones and muscles can be nourished. If the kidneys are deficient, bones become dry and marrow decreases, leading to muscle and tendon malnutrition, resulting in atrophy.

Suwen - Taiyin Yangming theory, "the limbs are endowed with gas in the stomach, but not to the meridian, must be due to the spleen, is endowed with", "spleen disease and the limbs do not use why? So that the spleen disease and can not be for the stomach line its fluid, the limbs are not endowed with water and grain gas, gas day to day to the decline, the pulse is unfavorable, sinews and muscles, all have no gas to produce, so do not use it", so doctors believe that the limbs that is the basis of the yang, the strength of the limbs reflect the spleen yang qi of the strength and weakness [6]. Suwen - impotence theory" in the 'spleen qi heat, the stomach is dry and thirsty, muscles are not benevolent, hair for meat impotence', the limbs rely on the spleen to transport the water and grain essence to nutrients, the spleen is not healthy will lead to limb impotence, from which emphasizes the importance of the spleen and stomach in the treatment of impotence. Li Gao, "Spleen and Stomach Theory - Spleen and Stomach Winning and Weakening Theory", then proposed that "for the most part, the spleen and stomach are weak, yang qi can not grow, is the order of spring and summer can not be, the five organs of the qi are not born. Spleen disease is downstream by the kidneys, is the lack of bone weakness, and is the bone impotence", the kidney is the foundation of the innate, the spleen is the foundation of the innate. The first born in the day after the day, the day after the day to support the innate, mutual nourishment and mutual use, together to promote the growth of bone and muscle, robust, if the spleen and stomach is weak can affect the kidney, resulting in kidney deficiency and bone impotence, which all illustrates the spleen and kidney in the development of impotence plays an important role in the development of the spleen and kidneys.

#### 4. The relationship between meridian acupoints and ALS

"Suwen, Impotence Theory" said, "Yangming is the sea of the five organs and six bowels. It mainly nourishes the Zong tendon. The Zong tendon is mainly responsible for binding the bones and connecting the organs. So when Yangming is deficient, the Zong tendon will be loose, and the veins are not connected. Therefore, the feet are weak and unable to move". It also put forward the "the impotence only takes Yangming" principle, believing that the Yangming meridian, as the meridian with abundant qi and blood, is the source of nutrition for the five organs and six bowels of the body. It can nourish the Zong tendon, and the Zong tendon is in charge of restraining the bones, making the joints move flexibly. If the Yangming meridian is weak, the Zongjian loss of nourishment will be impotent and weak limbs. In practice, the principle of "treating impotence by taking Yangming alone" also emphasizes the importance of tonifying the spleen and stomach. At this point, the spleen and stomach can be strengthened to enrich muscle volume and increase muscle strength. In addition to the use of drugs, acupuncture and moxibustion can also be used to generate and replenish qi and blood through acupuncture and moxibustion points on the foot-yangming stomach meridian, such as the shoulder, Quchi, and the foot-sanli, which can nourish the tendons and alleviate impotence symptoms [6]. The Su Wen - Bone Emptiness Treatise and Su Wen - The Essentials of Thoracic Acupuncture both mention the acupuncture of the Directing Vessel, pointing out the principles of treatment for lesions of the Directing Vessel and the relationship between the location of the disease and the depth of the needles, and emphasizing the fact that bone injuries affect the function of the kidneys, and that the Directing Vessel is related to the kidneys. And the acupuncture of the Directing Vessel can warm the internal organs and transmit essence, and studies have shown that it has good effects in promoting motor nerve recovery, improving muscle tone and joint mobility, and improving the quality of life of patients [7]. The Spiritual Pivot - the viscera "said" meridians, so the line of blood and qi and camp yin and yang, moistening tendons and bones, joints also", impotence for a long time, often involving

the tendons and bones, bone impotence, limb weakness, etc., the blood and qi must be through the meridians of the injection, to be able to lose cloth throughout the body, in order to moisturize the body's internal organs and tissues and organs. "Yang Qi, soft to support the tendons", needling the duclal vein can make the body Yang Qi full of Yang Qi, Yang Qi and impotence since the elimination [8].

## **5. Treating ALS from the perspective of acupuncture and moxibustion**

Acupuncture, as a characteristic external treatment method of traditional Chinese medicine, has the effects of dredging meridians and collaterals, harmonizing yin and yang, supporting the positive and dispelling the evil, improving the function of internal organs, and regulating the operation of qi and blood. From western medicine, the pathogenesis of ALS is related to glutamate excitotoxicity, oxidative stress, abnormal neurotrophic factors, apoptosis, protein aggregation and other factors [9]. And some studies have shown that the mechanism of action of acupuncture in treating ALS has inhibited glutamate excitotoxicity, reduced oxidative stress disorders, inhibited neuroinflammatory responses, and inhibited apoptosis [10]. In traditional Chinese medicine, ALS belongs to the category of "impotence", the etiology and pathogenesis of impotence are mostly related to the five organs, but also due to meridian blockage, poor qi and blood flow or qi and blood insufficiency, yin and yang imbalance caused by acupuncture can be used to treat impotence by improving the function of the internal organs, dredging the meridians and collaterals, regulating the qi and blood, moistening the tendons and veins and balancing the yin and yang. Therefore, through the overall diagnosis, according to the evidence of the selection of acupuncture points, through the stimulation of the relevant points to improve the patient's muscle atrophy symptoms, improve the quality of life of patients.

### **5.1 Strengthening the spleen and tonifying the kidneys in the treatment of ALS**

ALS to limb muscle weakness, muscle atrophy as the main clinical manifestations, the spleen and stomach as the innate qi and blood biochemistry, the main body of the muscle, in the support of muscle tissue to support the movement of the limbs plays a key role [11]. If the spleen is deficient, there is no source of biochemistry, and the muscles are not nourished; the kidney is the foundation of the innate, and the hidden essence is the main bone and marrow, and if the kidney is deficient, the marrow is not enough, and the muscles and bones are not nourished. And from the perspective of meridian circulation, the spleen foot Taiyin vein from the end of the big toe, along the inside of the leg up into the abdomen, belonging to the spleen and stomach, stopping under the tongue, its circulation from the foot to the head, through the upper and lower. The Spiritual Pivot pointed out that "it is related to the movement of the disease, with the body feeling heavy", "it mainly indicates that the spleen is sick, with the tongue being painful and the body unable to move" [12], ALS symptoms are mainly muscle atrophy and weakness! The symptoms of ALS are mainly characterized by muscular atrophy and weakness, and its location, nature of the disease and meridian identification are closely related to the onset of foot taiyin. The "Yellow Emperor's Classic of Internal Medicine Taisu" pointed out that "Shaoyin, kidney pulse", which can be seen that the basic mechanism of Shaoyin disease is the deficiency of kidney qi and kidney yang, which belongs to the deficiency of cold. ALS patients with prolonged deficiencies of the spleen and stomach, the source of the latter's biochemistry is not available, which in turn affects the root of the innate [12]. Therefore, strengthening the spleen and tonifying the kidney is an important principle in the treatment of ALS. Stimulating specific acupoints through acupuncture can regulate the function of the spleen and stomach, promote the generation of qi and blood, and nourish the muscles; at the same time, tonifying the kidneys and filling in the essence can enrich and nourish the bone marrow, and improve the neurological function. According to Xi'an Hospital for Brain Diseases of Traditional Chinese

Medicine, the Department of Brain Disease 2 has summarized many years of clinical experience and concluded that the spleen and kidney deficiency type ALS in the selection of acupuncture points, because of the hand, foot yangming meridian points and feet taiyin meridian points, as well as the main points of the spine, yangming meridian qi and blood, selection of upper and lower limbs of yangming meridian acupuncture points, the "treatment of impotence only to take the yangming" meaning. If the spleen and stomach are mainly weak, choose spleen Yu, stomach Yu, foot Sanli, Sanyinjiao and the epigastric region, etc. The spleen Yu is the back of the spleen. Among them, Spleen Yu is the back point of the spleen, which can strengthen the spleen and benefit the qi; Foot Sanli is the merging point of the foot Yangming stomach meridian, which can regulate the spleen and stomach and tonify the middle and benefit the qi; Sanyinjiao is the meeting point of the liver, spleen and kidney meridians, which can strengthen the spleen and nourish the blood; and the middle epigastrium is the raising point of the stomach, which can harmonize the stomach and strengthen the spleen. If kidney deficiency is the main cause, kidney yu, taixi and guanyuan are often used. Kidney Yu is the back point of the kidney, which can tonify the kidney and benefit the essence; Taixi is the original point of the foot-shao yin kidney meridian, which can nourish the yin and benefit the kidney; Guanyuan is an acupoint of the Ren vein, which can cultivate the energy and consolidate the root of the body, and can nourish the kidney and strengthen the yang. The selection of the spine point is because it is located on the side of the Duchenne, and the bladder meridian 1 lateral line of the internal organs of the back of the Yu point, can adjust the internal organs of the yin and yang, the line of qi and blood.

## 5.2 Acupuncture operation and precautions

When needling the above acupoints, the patient's body position should be selected in prone position first and then in supine position, with the intention that yang dominates yin and yin follows, and yang leads to yin and yang to achieve yin and yang harmonization, and qi should be gained when needling [13]. In case of muscle atrophy of the upper limbs, multiple needles were lined up on the hand Yangming meridian, while multiple needles were lined up on the foot Yangming meridian in case of muscle atrophy of the lower limbs. The pinch spine point is then stabbed obliquely towards the spine. Secondly, when treating ALS with acupuncture, attention should be paid to strict sterilization to prevent infection. The depth and intensity of needling should also be adjusted according to the patient's physical condition and tolerance level. Moxibustion can also be added at limb points, and electroacupuncture can also be used. For the weak, nervous patients, but also need to pay special attention to the observation of acupuncture reaction, to prevent the occurrence of adverse reactions such as fainting. Long-term bedridden patients should also maintain the functional position of the limbs, so as not to cause foot prolapse or inversion, if necessary, can be used to care for the brace and splint support. During the treatment period, active and passive limb function exercises should be strengthened to help early recovery. Because ALS is a progressive disease, in addition to acupuncture, Western medicine and Chinese herbal medicine are also needed to slow down the progression of the disease.

## 6. Conclusion

Although ALS is one of the rare diseases, the incidence rate is increasing year by year, and there is no cure for it in the medical field. In recent years, many medical practitioners have given full play to the characteristics and advantages of acupuncture in Chinese medicine to treat this disease [14]. For example, He Yunhan et al. explored the mechanism of electroacupuncture in the treatment of ALS and found that electroacupuncture could improve the motor function of mice, reduce the activation of microglia in the brainstem and spinal cord, inhibit the release of TNF-alpha, prolong the survival period, and improve the quality of life [14]. Zhu Wei et al [15] found that the modern acupuncture

treatment of ALS emphasizes the use of gastric, bladder, large intestine, and bile meridian acupoints, and emphasizes the acupoints of the limbs, especially the lower limbs [16], and that the flexible application of acupuncture tonic and diarrheal techniques, and the deficiency and reality of the disease in the treatment of ALS, all of which can achieve clinical efficacy. Acupuncture and moxibustion, as a characteristic external treatment method of traditional Chinese medicine, is easy to operate and has no obvious adverse effects. If the method of strengthening the spleen and tonifying the kidney is used as a guideline, stimulating the corresponding acupoints through acupuncture and moxibustion can strengthen the spleen and benefit the qi, tonify the kidney and fill in the essence, in order to improve the function of the patient's spleen and stomach and the essence of the kidney, so as to promote the operation of qi and blood, and to moisten and nourish the sinews and muscles. However, in the process of ALS treatment, in addition to acupuncture treatment, it is also necessary to combine the specific conditions of the patients with Chinese medicine and Western medicine to improve the clinical efficacy.

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