

Application Status of Fire Dragon Cupping Combined with Auricular Acupoint Pressing Beans on Muscle Strength Recovery in Patients with Acute Ischemic Stroke and Hemiplegia

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Abstract: Acute ischemic stroke frequently leads to hemiplegia in the acute phase, seriously impacting patients' motor function and quality of life. In Traditional Chinese Medicine, it is regarded as "wind stroke" (Zhong Feng) mainly caused by phlegm-stasis obstructing the collaterals, resulting in qi-blood stagnation and limb malnutrition. This article reviews the mechanisms and clinical use of Fire Dragon Cupping combined with Auricular Acupoint Pressing Beans for muscle strength recovery in these patients. Fire Dragon Cupping employs a special lotus-petal cup and ignited moxa with various techniques (tuina, guasha, acupoint pressure, moving cupping) to warm meridians, promote circulation, resolve stasis, dispel cold-dampness, relieve muscle spasms, and enhance local blood flow and muscle endurance. Auricular Acupoint Pressing Beans stimulates key ear points (Shenmen, Subcortex, Heart, Liver, Kidney, etc.) to regulate internal organs, balance the nervous system, and support neurological recovery. Together, they create an internal-external synergistic effect that effectively improves limb movement, reduces spasticity, accelerates muscle strength recovery, alleviates insomnia and pain, and enhances daily living abilities. This safe, economical, non-invasive, and well-accepted therapy shows strong potential for early clinical application in stroke rehabilitation.

Keywords: Acute Stage of Stroke; Fire Dragon Cupping Combined with Auricular Acupoint Pressing Beans; Muscle Strength

1. Introduction

Stroke, also known as "apoplexy" or "cerebrovascular accident," is a neurological disease characterized by cerebrovascular damage. It is a clinical condition with high

incidence, disability, and recurrence rates. It is primarily classified into hemorrhagic and ischemic stroke (IS). The former is caused by the rupture of intracranial blood vessels, while the latter results from blockage of cerebral blood vessels leading to reduced blood flow or infarction, thereby causing hypoxia, death of brain cells, and neurological damage [1].

Hemiplegia is one of the common complications in the acute phase of ischemic stroke and is the most impactful sequela affecting patients' quality of life. It undermines patients' confidence in treatment and often leads to secondary complications such as limb thrombosis, pressure ulcers, and irregular bowel and bladder habits, severely impacting their physical and mental health and reducing their quality of life [2].

In Traditional Chinese Medicine (TCM), cerebral infarction falls under the category of "wind stroke" (Zhong Feng). Among TCM pattern differentiations, phlegm-stasis obstructing the collaterals is the most common. The etiology lies in liver-wind carrying phlegm invading the meridians, resulting in obstructed blood flow, stagnant collaterals, and malnourishment of the body [3]. In recent years, TCM techniques have gained popularity, with Fire Dragon Cupping and Auricular Acupoint Pressing Beans being widely used in clinical practice. Auricular Acupoint Pressing Beans is a method of auricular therapy. It involves attaching cowherb seeds, mung beans, millet, magnetic beads, etc., to ear acupoints with adhesive tape and applying appropriate kneading, pressing, pinching, and pressure to generate sensory stimuli such as heat, numbness, distension, and pain along the meridians, thereby achieving therapeutic purposes [4]. Fire Dragon Cupping is a comprehensive moxibustion therapy integrating tuina (massage), guasha (scraping), moxibustion, massage, ironing, and acupoint pressure. It involves

burning a moxa stick inside the cup, generating pure yang properties likened to a dragon's mouth, assisted by ten manipulation techniques with its lotus-petal-shaped mouth to help the body dispel cold, remove dampness, resolve stasis, and stimulate meridians. Auricular Acupoint Pressing Beans regulates the functions of internal organs, while Fire Dragon Cupping externally relaxes muscles and tendons by stimulating acupoints on the limbs. This combination achieves internal-external harmonization to improve muscle strength and attain the therapeutic goal of relaxing tendons and unblocking collaterals. This paper aims to compare the effects on muscle strength recovery before and after intervention with Fire Dragon Cupping combined with auricular therapy, as studied below.

2. TCM Theoretical Understanding of Stroke

TCM's understanding of stroke is primarily based on its unique theoretical system, encompassing the theories of Yin-Yang and the Five Elements, Zang-Fu organs, and meridians and collaterals.

In TCM, stroke is typically classified under the "wind stroke" (Zhong Feng) category. Hemiplegic limbs belong to the "yang slackness and yin tension" concept within meridian theory. Treatment focuses on selecting acupoints mainly from yang meridians, supplemented by acupoints from yin meridians, while emphasizing that "yin can soften tendons," aiming to achieve a balance between yin and yang and restore relative equilibrium of the meridians. From the TCM theoretical perspective, a state of health results from a harmonious balance between the two opposing forces of yin and yang and the unobstructed flow of qi and blood. One or multiple predisposing factors can disrupt the internal yin-yang balance, especially conditions like hyperactive liver yang, phlegm-turbidity obstructing collaterals, and blood stasis in the vessels, ultimately leading to impaired cerebral blood circulation and triggering stroke. Based on clinical characteristics, it can be further divided into two major types: "stroke involving the meridians" and "stroke involving the zang-fu organs." The former manifests as symptoms like limb weakness or hemiplegia and facial deviation with clear consciousness; the latter includes the aforementioned symptoms accompanied by varying degrees of impaired

consciousness, with severe cases possibly presenting delirium or even coma. TCM employs different treatment methods based on the patient's specific condition, primarily including harmonizing yin and yang, resolving phlegm and unblocking collaterals, and activating blood circulation to resolve stasis.

3. Basic Principles of Fire Dragon Cupping and Auricular Acupoint Pressing Beans

3.1 Fire Dragon Cupping

It aims to regulate qi and blood, unblock meridians, alleviate pain, and promote recovery by acting on specific acupoints of the human body. Fire Dragon Cupping is a modified characteristic TCM therapy based on traditional cupping. Its unique lotus-petal-shaped cup mouth allows for operations like tuina, guasha, moxibustion, massage, ironing, and acupoint pressure. A moxa stick is placed inside the cup and ignited to produce a thermal effect. Combined with the cup's special structure and manipulation techniques, it can warm and unblock meridians, activate blood circulation to resolve stasis, and dispel wind and cold. Modern research suggests that the thermal radiation and photoelectrochemical effects produced during moxa combustion can inhibit inflammatory responses and oxidative stress, improve blood circulation, relieve muscle spasms, and alleviate pain. The physical stimulation from techniques like scraping and pushing, along with the chemical factors from moxibustion and other traditional therapies, interact with the acupoint sensitization mechanism and the conduction network of the meridian system, forming a unique "holistic synergistic effect." This comprehensive action primarily exerts therapeutic functions through four aspects: "tonifying, regulating, warming, and unblocking." Tonifying: The heat energy is extremely yang; the extensive and deep penetrating thermal stimulation from moxa radiation can temporarily increase local blood flow velocity and promote the resolution of inflammation. Regulating: Flow leads to free passage, free passage leads to regulation; increased blood flow stimulates and activates the body's own yang qi, enhancing immunity. Warming: The thermal radiation from moxa combustion dispels cold-dampness, promotes the movement of qi and blood, and alleviates qi stagnation and blood stasis caused by

cold-dampness. Unblocking: The special cup structure combined with techniques prevents muscle adhesions and maintains muscle cell vitality with external stimulation.

3.2 Auricular Acupoint Pressing Beans

Ancient texts such as the *Yinyang Shiyi Mai Jiujing Jiaben* (Eleven Yin-Yang Meridian Moxibustion Classic, Version A) document and corroborate the "ear meridian," stating it "originates from the back of the hand, ascends along the inner and outer sides of the upper arm, passes through the midpoint of the elbow, penetrates the axilla, and finally reaches the ear." The *Yellow Emperor's Inner Classic: Basic Questions* (Huangdi Neijing: Suwen) states: "The collateral meridians of the Hand and Foot Shaoyin, Taiyin, and Foot Yangming — these five collaterals all converge at the ear..." This indicates that the collateral meridians of the heart, liver, spleen, lung, and kidney channels all converge in the ear area, clearly elucidating the close connection between the twelve regular meridians and the ear. This forms the primary basis for diagnosing and treating diseases through auricular acupoint pressing [5]. The holographic theory of ear acupoints is an important theoretical foundation for TCM auricular therapy, combining TCM meridian theory with modern bioholography. TCM believes the ear is "where all vessels converge," with the qi and blood of the twelve regular meridians gathering at the ear. Modern research has found that the morphology and function of the ear are closely related to human embryonic development. The auricle is distributed with reflex zones corresponding to the whole body's zang-fu organs and parts, forming a holographic map of an "inverted fetus." In 1958, French expert Nogier further explained this bioholographic theory, stating that specific pathophysiological states of the human body manifest as somatization reactions in the ear and its surrounding areas [6]. According to the neurohumoral theory, the auricle contains a dense distribution of nerves, concentrated in areas like the scapha, cavum conchae, and triangular fossa [7]. The concha area possesses vagus nerve afferent fibers within the human surface structure. Stimulating the auricular branch of the vagus nerve in this area activates the central nervous system via afferent fiber pathways, regulating the functional state of internal organs. Research suggests physiological

regulation is achieved through modulating neurotransmitters, hormones, cytokines, and other jointly mediated substances. The neurohumoral theory provides molecular mechanistic support for auricular therapy.

4. Clinical Effects of Fire Dragon Cupping and Auricular Acupoint Pressing Beans

4.1 Limb Dysfunction

4.1.1 Fire dragon cupping

A major manifestation of stroke disability is hemiplegia in survivors, posing a significant threat to quality of life. Therefore, improving limb function in post-stroke hemiplegic patients can greatly reduce the economic burden on individuals, families, and society, representing a current urgent issue. For the upper limbs, the Hand Taiyin Lung Meridian is selected: acupoints Shaoshang (LU11), Taiyuan (LU9), Kongzui (LU6), Chize (LU5), Tianfu (LU3), Zhongfu (LU1). Stimulating this meridian can enhance the qi transformation function, help expel phlegm-dampness from the body, clear the respiratory tract, reduce lung burden, and strengthen the body's resistance. The Foot Yangming Stomach Meridian connects with the spleen and belongs to the stomach. The stomach is the sea of water and grains; the spleen grinds and transforms them, whereby the essence of water and grains transforms into nutrient and defensive qi. Dysfunction of the spleen and stomach leads to qi and blood deficiency in multiple organs. Stimulating acupoints on the Foot Yangming Stomach Meridian can regulate gastrointestinal function, ensuring sufficient qi and blood in the stomach meridian. The Foot Taiyin Spleen Meridian governs transportation and transformation of water and grains, controls the blood, governs the muscles, and its manifestation is in the lips. For the lower limbs, the Foot Taiyin Spleen Meridian is combined with the Foot Yangming Stomach Meridian: bilateral Zusanli (ST36), Sanyinjiao (SP6), and Yongquan (KI1) acupoints. This can generate qi and blood in bedridden patients, enrich qi and blood, address dampness-heavy foot swelling and loose stools, harmonize the spleen and stomach balance, improve appetite, and enhance nutrition [8]. Fire Dragon Cupping follows TCM meridian theory, utilizing the "warming and unblocking" effect of moxa thermal radiation to improve local microcirculatory disorders. The thermal radiation generated by

ignited moxa penetrates deep muscle tissue, promotes the metabolism of inflammatory factors, accelerates local blood circulation, improves tissue adhesion, thereby relieving muscle spasms, enhancing muscle endurance, and alleviating muscle pain [9]. The special lotus-petal structure of the Fire Dragon cup, employing techniques like acupoint pressure, cup manipulation, plucking and kneading, and hot compress during moving cupping, mobilizes the body's yang qi, achieving a "regulating and tonifying" effect. In a study by Chen Chunyan et al. exploring the effect of Fire Dragon Cupping on lower limb motor function in stroke patients based on surface electromyography, it was found that Fire Dragon Cupping had a significant effect on lower limb muscle groups, reducing patient anxiety and improving quality of life [10]. In a study by Wang Yueying et al. on the effect of meridian-based Fire Dragon Cupping combined with Chinese herbal hot compress on upper limb spasticity after stroke, it was found that Fire Dragon Cupping had a significant effect on upper limb muscle groups, more effectively reducing spasticity and promoting upper limb motor function recovery.

4.1.2 Auricular Acupoint Pressing Beans

Recent research teams using functional magnetic resonance imaging (fMRI) technology to explore the mechanisms of Residual Dizziness (RD) have shown that RD symptoms after successful repositioning for Benign Paroxysmal Positional Vertigo (BPPV) may be related to changes in the amplitude of low-frequency fluctuations (ALFF) in certain brain regions. ALFF is primarily used to detect the intensity of spontaneous brain activity; higher ALFF values indicate stronger spontaneous activity in the brain region [11]. Modern medical research indicates the auricle is covered with sensitive nerves. Auricular stimulation can induce neurophysiological changes; for example, stimulating vagus nerve afferent fibers can activate brain cells, significantly enhancing brain activation status in stroke patients, exerting a notable impact on the motor cortex network, and thereby regulating the autonomic nervous system. In a study by Zhang Guohui et al. on Auricular Acupoint Pressing Beans combined with TCM rehabilitation nursing for neurological function and quality of life in acute ischemic stroke patients, the application of Auricular Acupoint Pressing Beans combined with TCM

rehabilitation nursing in acute ischemic stroke patients showed definite effects, improving patients' neurological function and daily living abilities, enhancing quality of life, and reducing the incidence of adverse reactions [12].

4.2 Sleep Disorders

4.2.1 Auricular acupoint pressing beans

Related studies indicate that stroke may interfere with brain structures related to sleep, causing abnormal changes in neuroendocrine function within the brain, cerebrovascular damage, and disorders in the synthesis and secretion of neurotransmitters. Damage to the sleep-wake system neural network can induce insomnia. In TCM, insomnia (Bu Mei) refers to a condition of frequent difficulty falling asleep, easy awakening, or even sleeplessness throughout the night, caused by dysfunction of the zang-fu organs, imbalance of yin and yang, and malnourishment of the heart-spirit, corresponding to insomnia in Western medicine [13]. To calm the spirit, acupoints such as Occiput (AT3), Subcortex (AT4), Brainstem, Fengxi, Shenmen (TF4), Ear Apex (HX6, 7i) are selected, supplemented by Kidney (CO10), Sanjiao (CO17), Heart (CO15), Liver (CO12), and Supraangular Fossa. Auricular Acupoint Pressing Beans exerts a calming and analgesic effect by stimulating auricular reflex zones like "Shenmen" and "Subcortex," improving patients' nighttime pain, enhancing sleep quality, reducing patients' negative coping with pain, effectively alleviating treatment avoidance emotions, and achieving the effect of regulating nervous system reflexes and enhancing muscle endurance [14]. In a clinical observation study by Zhang Huajun et al. on timed Auricular Acupoint Pressing Beans for post-ischemic stroke insomnia, this study found that four weeks of timed Auricular Acupoint Pressing Beans treatment could shorten sleep latency, increase total sleep time, improve sleep efficiency, and enhance sleep quality, warranting clinical promotion.

4.2.2 Fire dragon cupping

There are numerous acupoints on the Hand Jueyin Pericardium Meridian and the Hand Shaoyin Heart Meridian. The regulatory effect of the wrist segment of the Heart Meridian is most representative, and the left-side acupoints have a closer afferent connection to the heart [15]. The Hand Jueyin Pericardium Meridian "originates in the chest, connects to the

pericardium," and is directly related to the heart. Neiguan (PC6) is a confluence point of the eight extraordinary vessels, capable of calming the heart and settling the spirit, harmonizing the stomach and calming the middle, regulating the Sanjiao, improving sleep quality, and alleviating anxiety. Shenmen (HT7) is the source point of the Heart Meridian, with effects of calming the heart and tranquilizing the mind, relieving anxiety and tension, and is a "primary main point" for treating insomnia. Sanyinjiao (SP6) is the confluence point of the Liver, Spleen, and Kidney meridians, with effects of soothing the liver and regulating qi, and nourishing the heart-spirit. In a study by Ren Leiyuan et al. on the application of Fire Dragon Cupping in nursing care for chest pain (Xiong Bi Xin Tong) with insomnia of qi stagnation and blood stasis type, it was found that the mechanical stimulation of tuina techniques reduces blood viscosity, lowers peripheral vascular resistance, stimulates the awakening of ischemic penumbra tissue, promotes neurological function recovery, and prevents muscle atrophy [15]. The deep penetrating thermal stimulation of Fire Dragon Cupping can better achieve the effects of balancing yin and yang, regulating the heart, improving sleep, and simultaneously promoting patient recovery [16-23].

5. Summary

Analyzing the reasons, rehabilitation training is a conventional intervention measure for post-stroke hemiplegia. It can start with passive limb activities for the patient, using external assistance to gradually promote muscle strength improvement. After a certain level of muscle strength is recovered, it transitions to active activities. Through progressively conducted early, middle, and late-stage rehabilitation training, it promotes the gradual recovery of patient walking, standing, and other balance abilities, improves daily living abilities, enhances sleep quality, and builds confidence in overcoming the disease. Fire Dragon Cupping combined with Auricular Acupoint Pressing Beans therapy integrates with each other, forming a comprehensive treatment plan. The interaction between thermal radiation and acupoints can stimulate meridian qi, improve the circulation of qi and blood, promote limb function recovery, while also directly acting on the lesion, exerting antispasmodic and analgesic effects. It improves patients' self-care and

balance functions. In summary, Auricular Acupoint Pressing Beans and Fire Dragon Cupping therapies show significant effects, are low-cost, easy to operate, have few side effects, and are highly accepted by patients. They can serve as intervention methods for early-stage hemiplegic patients and are worthy of clinical promotion. The limitation of this paper lies in the lack of controlled studies specifically comparing Fire Dragon Cupping and Auricular Acupoint Pressing Beans. Future research could focus on this aspect with scientific experimental design to further explore the effectiveness of the combined techniques.

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