

Elucidating the Understanding and Clinical Treatment Guidance of Huangdi Neijing (The Yellow Emperor's Inner Classic) on Stroke (Wind Stroke) Disease

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Abstract: This article focuses on the application of integrated traditional Chinese and Western medicine in the treatment of cerebrovascular diseases, particularly stroke (cerebral apoplexy). By reviewing the understanding of stroke in Huangdi Neijing (The Yellow Emperor's Inner Classic), the article elucidates the classical TCM perspectives on the etiology and pathogenesis of stroke, such as the theories that "excessive anger causes the collapse of bodily form and qi, leading to blood stagnation in the upper body" and "wind dominance results in movement disorders." Integrating modern medical viewpoints, the article highlights the high incidence and disability rates associated with stroke. It also introduces the unique advantages of TCM in treating stroke through the theory of Opening, Closing, and Pivoting (Kai He Shu), particularly the role of the three yang meridians (Taiyang, Shaoyang, and Yangming). The clinical experience and research achievements of TCM experts, such as Professor Zhang Xuewen, demonstrate the efficacy of TCM in regulating qi and blood, harmonizing the zang-fu organs, and balancing the meridians. These contributions provide strong support for reducing the incidence of stroke and improving patients' quality of life.

1. Introduction

Stroke is a clinical condition characterized by symptoms such as hemiplegia (half-body paralysis), numbness of the skin, facial deviation, slurred speech, and in severe cases, sudden collapse and loss of consciousness[1]. Due to its abrupt onset and rapid progression, it is named "wind stroke" (zhong feng) in TCM, reflecting its similarity to the Huangdi Neijing (The Yellow Emperor's Inner Classic) description of "wind's nature to move swiftly and change frequently." In modern clinical practice, it is also referred to as cerebral apoplexy or stroke, and is marked by five major characteristics: high incidence, high disability rate, high mortality rate, high recurrence rate, and high economic burden[2]. It is the leading cause of death and disability among adults in China. The etiology of stroke is multifactorial and complex, but at its core, it is a vascular disease. Most cases are closely associated with high-risk factors such as hypertension, hyperlipidemia, and

diabetes. In contemporary society, the general public's lack of health awareness, coupled with widespread unhealthy dietary habits and lifestyle patterns, has led to a persistently high incidence of stroke. Moreover, this phenomenon is increasingly affecting younger populations, with rising incidence rates among middle-aged and young adults. According to the Global Burden of Disease (GBD) 2019 report, stroke has become one of the top three leading causes of years of life lost globally[3]. In China, the situation is particularly severe. Data from the China Health Statistics Yearbook (2021) show that the average hospital stay for cerebral hemorrhage patients treated in public hospitals was 15.1 days, while for cerebral infarction patients, it was 9.8 days. Furthermore, data from the Neurology Department of West China Hospital highlight the severity of the disease: among ischemic stroke patients admitted between 2012 and 2016, the disability rate within three months was as high as 28.7%, and even after 12 months, it remained at 17.6%[4]. These statistics underscore the significant acute and chronic challenges stroke poses to public health in China. As one of the four major classics of TCM, Huangdi Neijing contains detailed records on the understanding and treatment of stroke, guiding generations of physicians in its clinical diagnosis and management. This has led to the development of a unique TCM-based treatment system for stroke. This article will elaborate on Huangdi Neijing's understanding of stroke and its clinical treatment guidance.

2. Huangdi Neijing's Understanding of Stroke

As an ancient medical text, Huangdi Neijing (The Yellow Emperor's Inner Classic) first introduced the term "wind stroke" (zhong feng). However, this concept differs significantly from the modern medical definition of stroke[1]. In Huangdi Neijing, descriptions such as "wind stroke due to alcohol consumption," "wind stroke after sweating during intercourse," and "wind stroke after bathing" emphasize the invasion of external wind pathogens under specific circumstances, each with unique triggers. In contrast, modern stroke primarily refers to a condition caused by internal weakness, emotional fluctuations, and external pathogenic factors, leading to the invasion of brain collaterals by wind-phlegm or other pathogens. It may also result from abnormal qi and blood circulation, causing rebellious qi to rush upward to the brain, obstructing brain vessels or even causing blood to extravasate. This leads to severe symptoms such as sudden collapse, hemiplegia, limb numbness, facial deviation, and slurred speech, all of which are manifestations of brain dysfunction[5]. Thus, the modern definition of stroke is more complex, encompassing pathophysiology, clinical manifestations, and etiology. Nevertheless, some descriptions of diseases in Huangdi Neijing align with the symptoms of modern stroke. For instance, terms like "mild syncope" (bo jue), "severe syncope" (da jue), and "sudden syncope" (bao jue) describe sudden collapse and loss of consciousness following stroke. For example, Huangdi Neijing states: "Excessive anger causes the collapse of bodily form and qi, leading to blood stagnation in the upper body and resulting in mild syncope[6]." The clinical manifestations of joint and muscle stiffness, spasms, and limited mobility after stroke can be categorized under "sinew disorders" (jin bing) or "convulsive syndromes" (jing zheng). Suwen • Zhi Zhen Yao Da Lun (Plain Questions: The Great Treatise on the Ultimate Truth) states: "All sudden stiffness and rigidity are related to wind." Suwen • Yinyang Yingxiang Dalun (Plain Questions: The Great Treatise on Yin-Yang Correspondences) adds: "Wind dominance results in movement disorders." These passages suggest that symptoms such as limb stiffness and muscle spasms are associated with wind pathogens. Lingshu • Xieke (Spiritual Pivot: On Pathogenic Factors) further explains: "Pathogenic factors and stagnant blood cannot remain in the body. If they linger, they damage the sinews, collaterals, and joints, leading to restricted movement and spasms." This indicates that the stagnation of pathogenic factors and blood in the body can impair joint function and cause spasms. Limb numbness, on the

other hand, falls under the TCM categories of "numbness" (ma mu) or "loss of sensation" (bu ren). Suwen • Nitiao Lun (Plain Questions: On Counterflow Disorders) records: "Deficiency of nutritive qi (ying qi) leads to loss of sensation, while deficiency of defensive qi (wei qi) results in impaired function. Deficiency of both causes both loss of sensation and impaired function." This suggests that the pathogenesis of limb numbness is due to the inability of deficient nutritive qi to nourish the muscles and deficient defensive qi to maintain normal limb function[7]. From the above passages in Huangdi Neijing, it is evident that although the descriptions of stroke in Huangdi Neijing differ from modern stroke, the symptoms of modern stroke are documented in the text. The theoretical explanations of the etiology and pathogenesis of stroke-related symptoms, as well as the treatment principles outlined in Huangdi Neijing, have profoundly influenced later generations of TCM physicians in treating stroke.

3. Huangdi Neijing's Explanation of the Etiology and Pathogenesis of Stroke

The primary location of stroke is the brain, and its nature can be categorized into deficiency and excess. Modern medicine attributes the pathogenesis of stroke to internal weakness, emotional disturbances, and external factors, which lead to the invasion of brain collaterals by wind-phlegm pathogens or the disruption of qi and blood circulation, causing rebellious qi to rush upward to the brain, obstructing brain vessels or even causing blood to extravasate. Huangdi Neijing also provides descriptions of the etiology and pathogenesis of various stroke symptoms.

"Excessive anger causes the collapse of bodily form and qi, leading to blood stagnation in the upper body and resulting in mild syncope (bo jue)[2]." It further explains: "Anger causes qi to rise." Anger is associated with the liver, and excessive anger leads to hyperactivity of liver qi, causing qi and blood to surge upward. The term "stagnation" (yu) refers to the blockage of qi and blood in the brain vessels, forming blood stasis that obstructs brain vessels or even causes blood to extravasate. When the brain is deprived of nourishment from qi and blood, coma occurs. Another passage states: "Deficiency of nutritive qi (ying qi) leads to loss of sensation, while deficiency of defensive qi (wei qi) results in impaired function. Deficiency of both causes both loss of sensation and impaired function." This highlights that the key pathogenesis of numbness in stroke lies in the weakness of nutritive qi, which fails to nourish the skin, and the deficiency of defensive qi, which impairs its ability to protect the body from external pathogens and maintain joint mobility. When external pathogens such as wind, cold, and dampness invade the brain collaterals, they disrupt qi and blood circulation, leading to blood stasis and stroke. Internal factors such as phlegm and fluid retention can also flow into the sinews, joints, and muscles, causing hemiplegia or limb numbness. The human body relies on yang qi for warmth and normal physiological functions. Sufficient yang qi ensures the proper functioning of the zang-fu organs, body structures, and orifices, maintaining the normal circulation of qi, blood, and body fluids to nourish them. When this nourishment is lost, symptoms such as numbness or hemiplegia occur. Suwen Zhi Zhen Yao Da Lun (Plain Questions: The Great Treatise on the Ultimate Truth) states: "All sudden stiffness and rigidity are related to wind." Suwen Yinyang Yingxiang Dalun (Plain Questions: The Great Treatise on Yin-Yang Correspondences) adds: "Wind dominance results in movement disorders." Wind is characterized by its swift movement and frequent changes. External wind pathogens or internally generated wind can disrupt the meridians, causing abnormal spasms, stiffness, and tremors. Lingshu Xieke (Spiritual Pivot: On Pathogenic Factors) further explains: "Pathogenic factors and stagnant blood cannot remain in the body. If they linger, they damage the sinews, collaterals, and joints, leading to restricted movement and spasms." This indicates that the stagnation of pathogenic factors and blood in the body can impair joint function and cause spasms.

Based on Huangdi Neijing, the etiology and pathogenesis of stroke-related symptoms can be summarized as follows: 1. Exposure to external wind pathogens: Wind pathogens are characterized by their wide range of effects, rapid changes, and swift onset, which align with the clinical manifestations of stroke. 2. Emotional disturbances: Intense emotions, such as excessive anger, can cause the collapse of bodily form and qi, leading to blood stagnation in the upper body and triggering stroke. 3. Stagnation of internal or combined pathogens: Pathogenic factors, whether internally generated or a combination of internal and external factors, can stagnate in the body, invade the sinews, bones, and joints, and impair joint mobility, resulting in symptoms such as spasms. This mechanism is also related to post-stroke limb spasticity. 4. Deficiency of both nutritive and defensive qi: Deficiency of nutritive qi (ying qi) fails to nourish the muscles of the limbs, while deficiency of defensive qi (wei qi) impairs the normal function of the limb muscles, leading to numbness.

4. Huangdi Neijing's Insights on the Treatment of Stroke

The theory of Opening, Closing, and Pivoting (Kai He Shu) is found in Suwen ·Yinyang Lihelun (Plain Questions: The Separation and Union of Yin and Yang), which states: "Thus, the separation and union of the three yang meridians are as follows: Taiyang is the opening, Yangming is the closing, and Shaoyang is the pivot..." [4] The concepts of Opening, Closing, and Pivoting are crucial components of TCM theory, describing the ascending, descending, entering, and exiting movements of qi, which are fundamental to life. This theory is based on the Root-Knot (Gen Jie) theory and primarily revolves around the three yang meridians of the foot. It outlines the pathological manifestations and treatment principles related to Opening, Closing, and Pivoting. Later generations of physicians have further elaborated on and applied this theory to clinically guide the treatment of stroke.

In Suwen ·Yinyang Lihelun, it is stated: "The Taiyang meridian is rooted at Zhiyin and connects at Mingmen... Thus, if the opening is impaired, the flesh and joints become dysfunctional, leading to sudden illness... Dysfunction manifests as emaciation, dryness, and weakness of the skin and muscles... Therefore, for sudden illnesses, treat the Taiyang meridian, assessing excess and deficiency [7]." The Dictionary of Huangdi Neijing explains "flesh and joints" (rou jie) as the junctions between muscles, "dysfunction" (du) as emaciation, dryness, and weakness of the skin and muscles, and "sudden illness" (bao bing) as diseases that strike abruptly and severely. Based on this text, it can be interpreted that the Taiyang meridian, rooted at Zhiyin and connecting to the eyes, serves as the body's first line of defense against external pathogens. When the Taiyang meridian is impaired (i.e., "opening is impaired"), abnormalities in the skin and muscles arise, manifesting as emaciation, dryness, weakness, and even sudden illness. Such sudden illnesses often originate from the Taiyang meridian, so treatment should focus on regulating and harmonizing its qi. Professor Zhang Xuewen, a master of TCM, has unique insights into this. He believes that stroke and its sequelae, particularly symptoms such as limb spasms and foot inversion, are manifestations of obstructed qi and blood in the Taiyang meridian. As the outermost layer of the body, the Taiyang meridian is often the first to be invaded by external pathogens. Therefore, maintaining the free flow of Taiyang meridian qi is crucial for preventing and treating stroke and its sequelae. Through years of clinical practice, Professor Zhang has skillfully adapted Xuming Tang (Life-Restoring Decoction) from Gujin Luyan (Ancient and Modern Recorded Formulas), successfully alleviating long-standing foot inversion in many patients. Professor Zhang, deeply versed in TCM principles, considers ephedra (ma huang) a key herb for opening the Taiyang meridian. Its use fully embodies the comprehensive and unique approach of TCM in treating stroke. He advocates that Xuming Tang can be a vital treatment option for stroke, regardless of whether the condition is acute or chronic.

Professor Zhang emphasizes that simply supplementing qi and activating blood may be insufficient; it must be combined with warming yang, promoting blood circulation, and unblocking meridians to achieve efficacy. The application of Xuming Tang and its derivatives should not be limited by the specific cold or heat manifestations of stroke but should focus on the patient's overall condition and specific symptoms, especially limb spasms, which can be seen as signs of qi and blood stasis in the Taiyang meridian within the six-meridian differentiation of stroke. Professor Zhang's clinical practice not only vividly illustrates the TCM principle that "Taiyang is the opening, and meridian qi should flow smoothly" but also demonstrates through practical results that precise regulation of Taiyang meridian qi can effectively treat stroke and its sequelae. This innovative treatment approach enriches the TCM therapeutic system for stroke[8].

Suwen Yinyang Lihelun states:"The Shaoyang meridian is rooted at Qiaoyin and connects at Chuanglong... Shaoyang serves as the pivot... If the pivot is impaired, the bones become unstable and unable to stand firmly on the ground. Therefore, for bone instability (gu yao), treat the Shaoyang meridian, assessing excess and deficiency. Bone instability manifests as joint laxity and lack of control." The term "yao" refers to shaking or excessive movement, while "huan" denotes slowness or looseness, indicating a lack of control[9]. The Shaoyang meridian of the foot plays a pivotal role as the "pivot" in TCM theory. When this pivot is impaired (i.e., "Shaoyang pivot impairment"), it leads to the symptom of "bone instability" (gu yao), characterized by unsteady and sluggish movement of the limb joints, as if the bones have lost their support and restraint, making it difficult to stand firmly. In stroke patients, especially during the early stages of the disease, symptoms such as muscle weakness in the affected lower limb, reduced support capacity during the flaccid paralysis phase, and subsequent development of adductor muscle spasms, atrophy of the lateral muscle groups during the spastic paralysis phase, as well as complications like muscle atrophy, hip subluxation, foot drop, and foot inversion, closely resemble the pathological state of "Shaoyang pivot impairment" from a TCM perspective. Based on this, scholars such as Cao Lianying have proposed that targeted stimulation of specific acupoints along the Shaoyang meridian of the foot can precisely activate the peroneus longus and brevis muscles, effectively enhancing the strength of the foot evolver muscles[10]. This improves the patient's ability to control ankle movement actively. This therapeutic approach not only leverages the regulatory mechanisms of meridian and acupoint theory but also incorporates the unique physiological effects of acupuncture on acupoints. Clinical practice has demonstrated that this method significantly promotes the recovery and improvement of motor function in stroke patients with foot inversion.

Suwen Yinyang Lihelun states:"The Yangming meridian is rooted at Lidui and connects at Sangda... Yangming serves as the closing... If the closing is impaired, qi has no place to settle, leading to the onset of atrophy disorders (wei ji). Therefore, for atrophy disorders, treat the Yangming meridian, assessing excess and deficiency." Suwen Zhi Zhen Yao Da Lun (Plain Questions: The Great Treatise on the Ultimate Truth) further explains:"What is Yangming? Qibo replied: It is the convergence of the two yangs." The term "closing" (he) refers to gathering or closing. As the "closing" meridian, Yangming relies on the abundance of its qi. If the production of qi and blood in Yangming is insufficient, qi cannot settle smoothly, leading to atrophy disorders characterized by weakness, muscle atrophy, and emaciation. According to traditional medical theory, the term "atrophy" (wei) in Huangdi Neijing specifically refers to a category of disorders marked by flaccidity and weakness of the sinews and vessels. In severe cases, the hands cannot grasp objects, the feet cannot support the body, the joints seem out of control, and muscle atrophy gradually develops, impairing normal movement. This definition aligns with the explanations in the Dictionary of Huangdi Neijing and shares some commonalities with stroke symptoms. Professor Zhang Xuwen has elaborated on the correspondence between "Yangming as the closing" and "Taiyin as the opening," emphasizing their synergistic role in regulating the ascending and

descending functions of the middle burner (spleen and stomach). This further enriches the treatment principles for atrophy disorders in Huangdi Neijing. He believes that the root cause of atrophy disorders lies in the dysfunction of the Yangming meridian's opening and closing mechanisms. Therefore, the key to treatment is to tonify the qi of the middle burner and promote the inward gathering of Yangming qi, thereby strengthening the spleen and stomach's ability to transport and transform fluids. This nourishes the limbs and restores their function. Other scholars propose that "qi has no place to settle" refers to qi that should normally descend but instead rebels upward. This aligns with the fundamental pathogenesis of stroke—disruption of qi movement and imbalance in ascending and descending, leading to mental disturbances and loss of limb control. From this perspective, syncope syndromes such as "mild syncope" (bo jue) and "heat syncope" (jian jue) described in Huangdi Neijing are also intrinsically related to stroke. Based on these theories, acupuncture treatment for stroke can focus on the Yangming meridian, adopting a dual strategy: 1.Addressing the root cause of rebellious qi to calm the counterflow. 2.Following the meridian pathways and applying the principle of "treating atrophy by focusing on Yangming" to precisely treat post-stroke limb motor dysfunction. This approach not only highlights the importance of qi as the fundamental substance of life activities but also provides a solid theoretical and practical foundation for treating stroke from the perspective of the Yangming meridian[11].

5. Clinical Research on Integrated Chinese and Western Medicine in Stroke Treatment

Integrated Chinese and Western medicine for stroke, as a comprehensive treatment model that combines the strengths of both medical systems, has demonstrated significant advantages in clinical practice[11]. This approach not only enhances clinical efficacy but also improves patients' health outcomes across multiple dimensions. Numerous authoritative studies have shown that the overall effectiveness of combined Chinese and Western medicine treatment is significantly superior to Western medicine alone. This integrated treatment model can more effectively reduce inflammatory responses, improve cerebral hemodynamic parameters, mitigate brain tissue damage, and promote the recovery of neurological functions. Additionally, it offers a high level of safety, reducing the likelihood of adverse reactions during treatment. In practical applications, as demonstrated by Shi Chunming's research, the treatment regimen combining edaravone with Xueshuantong injection (a traditional Chinese medicine) significantly reduces inflammatory responses and improves cerebral hemodynamics compared to using edaravone alone. This highlights the unique advantages of integrated Chinese and Western medicine in ameliorating the pathophysiological processes of stroke. Zhou Ying's research further confirms the value of integrated Chinese and Western medicine in stroke rehabilitation. By combining TCM rehabilitation principles with Western rehabilitation techniques, it more effectively improves patients' neurological deficits, enhances their ability to perform daily activities, and helps them reintegrate into society more quickly[12].

In summary, integrated Chinese and Western medicine for stroke fully leverages the strengths of both medical systems, playing a positive role in alleviating patients' suffering, reducing the burden on families and society, and improving patients' quality of life. Therefore, in future clinical practice, this comprehensive treatment model should be further promoted and applied to better serve stroke patients.

6. Conclusions

This article provides an in-depth analysis of the intersection between Huangdi Neijing's (The Yellow Emperor's Inner Classic) traditional understanding of stroke and modern medical perspectives, offering unique insights into the etiology and pathogenesis of stroke from a TCM viewpoint. By exploring the TCM theory of Opening, Closing, and Pivoting (Kai He Shu),

particularly the distinctive roles of the three yang meridians (Taiyang, Shaoyang, and Yangming) in regulating qi and blood, harmonizing the zang-fu organs, and balancing the meridians, it reveals the remarkable efficacy of TCM in treating stroke[13]. TCM methods not only help reduce the incidence and disability rates of stroke but also significantly improve patients' quality of life and alleviate economic burdens. Against the backdrop of the increasing global burden of stroke, the discussions in this article hold significant practical relevance. In the future, the integrated Chinese and Western medicine approach to cerebrovascular treatment is expected to be applied more broadly, driving advancements in medical research and technology. This will provide stroke patients with more comprehensive and effective treatment options.

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