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Exploring the Prevention and Treatment of Diabetes Mellitus Based on the Root-and-Branch Theory of the Huangdi Neijing

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Abstract: ***The root-and-branch (Biao-Ben) theory originates from the Huangdi Neijing (Inner Canon of the Yellow Emperor), a foundational classic of Traditional Chinese Medicine (TCM), and represents a distinctive methodology for understanding and treating disease. It provides crucial guidance across all stages of diabetes mellitus (Xiaoke disease)—including prevention, diagnosis, and treatment. The root-and-branch theory emphasizes pathogenic mechanism diagnosis in Xiaoke disease, positing that yin deficiency constitutes the root and dryness-heat the branch. Although its secondary manifestations are complex and varied, the principal symptoms of the three types of Xiaoke (upper, middle, and lower) remain the root, while variant symptoms are the branch—necessitating, when appropriate, the principle of "treating the branch urgently in acute conditions." Furthermore, prevention should be prioritized as the root, with treatment as the branch. Guided by the root-and-branch theory, Xiaoke disease can be diagnosed and treated early, complications reduced, and patient prognosis improved to the greatest extent.***

Keywords: Huangdi Neijing, Root-and-branch theory, Xiaoke disease (diabetes mellitus), Prevention and treatment**.**

1. Introduction

Suwen (Plain Questions), in the chapter "On Root-and-Branch Disease Transmission" (Biaoben Bingzhuan Lun), states: "He who understands root and branch will succeed in every endeavor; he who does not will act in vain." In TCM philosophy, the concepts of root (ben) and branch (biao) are relative—the root-and-branch relationship is commonly employed to summarize and explain the essence and manifestations of phenomena, causal relationships, and the primary versus secondary, antecedent versus subsequent contradictions in the course of disease. From the perspective of the doctor-patient relationship, the patient is the root and the physician the branch. From the perspective of the healthy-qi versus pathogenic-factor relationship, the body's healthy qi is the root and the pathogenic factor is the branch. From the perspective of cause and symptom, the cause is the root and the symptom is the branch. From the temporal perspective of disease progression, the chronic or primary disease is the root and the acute or secondary disease is the branch [1]. From the perspective of disease location, internal and lower lesions are the root, while external and upper lesions are the branch; diseases of the zang-fu organs and nutritive qi are the root, while diseases of the muscles, skin, and meridians are the branch. Thus, root and branch are not absolute but relative and conditional. In clinical practice, mastering the root-and-branch relationship of a disease enables accurate differentiation of the primary and secondary aspects, as well as the severity and urgency of the condition, thereby allowing the physician to identify and address the principal contradiction or the principal aspect of the contradiction amid complex pathological dynamics. Similarly, the root-and-branch theory of the Neijing provides essential guidance for the prevention and treatment of Xiaoke disease.

2. Understanding of Xiaoke Disease

Xiaoke ("wasting-thirst") is a comprehensive disease characterized primarily by excessive thirst with frequent drinking, excessive hunger with increased food intake, frequent urination with copious volume, progressive emaciation, or sweetness in the urine. It is a common, difficult-to-cure, multifaceted, and refractory condition [2]. The disease name first appeared in Suwen, chapter "On Strange Diseases" (Qi Bing Lun): "Fatty foods generate internal heat; sweet foods create internal fullness. Thus, their qi overflows upward and transforms into Xiaoke." The pathogenesis of Xiaoke is complex, involving genetic, environmental, and lifestyle factors. TCM holds that Xiaoke is primarily caused by congenital insufficiency, irregular diet, emotional disharmony, and excessive physical or sexual exertion [3], with the pathological location involving the lung, stomach, and kidney, and the fundamental pathogenesis being yin deficiency with dryness-heat. Modern medicine emphasizes the pivotal role of insufficient insulin secretion or impaired insulin action in the onset of diabetes mellitus. With improvements in living standards and changes in dietary structure, the incidence of Xiaoke has risen year by year, with a trend toward younger onset. This not only severely impacts patients' quality of life but also leads to a series of complications, including cardiovascular disease, diabetic nephropathy, and retinopathy, imposing a heavy economic and psychological burden on patients and their families. Therefore, the prevention and treatment of Xiaoke is of paramount importance.

3. Root and Branch in Xiaoke Disease

3.1 Pathogenic Mechanism: Root and Branch

In clinical practice, the three major symptoms of polydipsia, polyphagia, and polyuria often coexist, but their relative severity varies. Earlier physicians classified Xiaoke into

upper, middle, and lower types based on the predominance of clinical manifestations, serving as a basis for syndrome differentiation and treatment. Despite this threefold classification, the fundamental pathogenesis remains yin deficiency with dryness-heat, wherein yin deficiency is the root and dryness-heat is the branch. The two often act as cause and effect upon each other: the more severe the dryness-heat, the more deficient the yin; the more deficient the yin, the more intense the dryness-heat. If protracted, the condition may further evolve into damage to both qi and yin, and eventually involve kidney yang, resulting in deficiency of both yin and yang. If chronic disease penetrates the collaterals, dryness-heat scorches yin fluids, leading to impaired circulation of qi and blood, stagnation of blood, and obstruction of the meridians, thereby worsening the patient's condition or giving rise to severe variant manifestations.

The pathological involvement in Xiaoke encompasses the lung, stomach (spleen), and kidney. Lung dryness, stomach heat, and kidney deficiency mutually influence one another, with all three types of Xiaoke presenting concurrently but with varying emphasis. The lung is the upper source of water and governs the regulation and distribution of water passages. When dryness-heat damages body fluids, the jin-ye (nutritive fluids) flow directly downward without proper distribution, resulting in frequent and copious urination. The lung's diminished ability to distribute fluids prevents upward moistening of the mouth, leading to excessive thirst and drinking. The stomach governs the decomposition of food, while the spleen governs the transformation and transportation of food essence. When dryness-heat injures the spleen and stomach, stomach fire rages and spleen yin becomes insufficient, resulting in excessive thirst and drinking alongside insatiable hunger. Spleen deficiency impairs transportation, causing food essence to be lost directly in the urine, which then becomes sweet. The depletion of food essence, unavailable for the body's use, leads to progressive emaciation. The kidney is the foundation of congenital constitution, housing both primordial yin and primordial yang, and governs the storage of essence. Deficiency of kidney yin generates internal deficiency-fire, which scorches the heart and lung upward (causing thirst and excessive drinking) and consumes the spleen and stomach midway (causing stomach heat and rapid digestion). When the kidney loses its nourishment, its opening and closing functions become impaired, allowing food essence to flow downward and be excreted in the urine. The above describes the pathological process of the three types of Xiaoke. Surveying the entire pathological course, the three manifestations are the branch while the zang-fu organs are the root; among the organs, kidney deficiency with water depletion is the root, while lung and stomach dryness-heat is the branch. Although the disease is divided into upper, middle, and lower types, it never transcends the framework of yin deficiency with dryness-heat and heat scorching yin fluids [4].

3.2 Symptoms: Root and Branch

The "three excesses and one deficiency" (polyuria, polydipsia, polyphagia, and emaciation) represent the principal clinical manifestations of Xiaoke. However, the degree of expression varies considerably among individuals—some patients may not exhibit any of the above symptoms during the entire course of the disease, with Xiaoke being diagnosed only after variant complications appear. Compared with the principal symptoms, the variant manifestations are more complex, variable, and difficult to treat. For instance, when the lung loses its moistening nourishment over time, pulmonary tuberculosis may develop as a complication. Given the shared origin of the liver and kidney, kidney yin deficiency leads to failure of liver nourishment, and the depletion of liver-kidney essence-blood fails to ascend to the ears and eyes, resulting in cataracts, night blindness, and deafness. Internal accumulation of dryness-heat scorches nutritive ying, obstructs the collaterals, and fosters toxin formation, leading to boils, carbuncles, and furuncles. Yin deficiency with intense internal dryness-heat refines fluids into phlegm; phlegm obstructs the meridians and clouds the heart orifice, resulting in wind-stroke with hemiplegia [5]. Damage to yin affecting yang, with spleen-kidney failure, leads to water-damp retention and generalized edema. If yin fluids are severely depleted and deficient yang floats outward, signs such as facial flushing, headache, restlessness, nausea, vomiting, sunken eye sockets, dry red lips and tongue, and deep prolonged breathing may appear. Ultimately, exhaustion of yin and collapse of yang may lead to coma, cold limbs, and a faint, barely perceptible pulse—a critical and life-threatening state. In the late stage of Xiaoke, yin consumption injures qi, and dryness combined with stasis leads to pathological changes in the zang-fu organs, qi, blood, and meridians, culminating in severe complications. Therefore, although the three Xiaoke symptoms are the root, the principle of "treating the branch urgently" must be applied according to different variant manifestations to prevent severe complications that may endanger life.

3.3 Prevention and Treatment: Root and Branch

In Suwen, chapter "On Regulating the Spirit According to the Four Seasons" (Siqi Tiaoshen Da Lun), the philosophical principle is profoundly articulated: "The sage treats not the established disease but the incipient one; he does not address an existing disorder but prevents its occurrence." This concept has been esteemed by generations of physicians and demonstrates unique value in the prevention and treatment of Xiaoke disease. Its core principle—"treating before illness manifests" (zhi wei bing)—emphasizes intervention before the disease occurs or in its earliest stages, preventing onset or deterioration. Such forward-looking thinking is particularly vital for Xiaoke, a disease with insidious onset that is easily overlooked. As a chronic metabolic disease, Xiaoke often has a long course, and its initial symptoms are subtle, making early detection difficult for many patients, who thus miss the optimal window for treatment. Therefore, early diagnosis and early treatment are critical. The philosophy of "treating before illness manifests" requires that even before disease manifests, reasonable measures—diet, sleep-wake cycles, and emotional regulation—be employed to prevent onset or delay progression, achieving effective control of Xiaoke [6]. Early identification and effective treatment may halt or even reverse the development of chronic complications in their early stages. Thus, the prevention and treatment of Xiaoke should follow the Neijing's "treat before illness manifests" guidance: prevent before illness, prevent progression once ill. Prevention is the root; treatment is the branch—reducing complications and preventing further evolution of the disease.

4. Prevention

4.1 Moderation in Diet and Regulation of the Spleen and Stomach

The food essence (shui gu jing wei) derived from diet is the fundamental condition for human survival and the source of the five zang organs' essence. However, dietary imbalance can damage this essence. The occurrence of Xiaoke is closely related to dietary irregularity. Suwen, chapter "On Bi Syndrome" (Bi Lun), states: "When food intake exceeds normal limits, the stomach and intestines are injured." This illustrates that moderation in diet is essential for protecting the spleen and stomach. Dietary indiscretion not only damages the spleen and stomach but, over time, can also lead to indigestion. Prolonged food stagnation may transform into internal heat, accumulate dampness, generate phlegm, and even impede the circulation of qi and blood, thereby triggering and exacerbating Xiaoke. Suwen, chapter "On the Ancient Way of Nourishing Life" (Shanggu Tianzhen Lun), states: "Ancient people who understood the Way... ate and drank in moderation... and thus could keep body and spirit together, living out their full natural lifespan." It is evident that preventing Xiaoke requires "moderation in eating and drinking," and that dietary control must be a cornerstone of Xiaoke treatment. Moderation is especially important regarding meat, sweets, and other rich, greasy, fatty foods. Suwen, chapter "On Strange Diseases," states: "This person must frequently consume sweet, delicious, and fatty foods. Fat generates internal heat; sweetness creates internal fullness. When their qi overflows upward, it transforms into Xiaoke." This explains that overconsumption of fatty and sweet foods leads to obesity, impairs spleen-stomach transportation, generates phlegm-turbidity, disrupts the ascending-descending function of qi, and interferes with the distribution of food essence, thereby transforming into Xiaoke.

Dietary control is the foundation of Xiaoke treatment. Patients should follow physician-guided meal plans with reasonable combinations and eat at regular times [8]. Suwen, chapter "On the Five Zang Qi in Relation to the Four Seasons" (Zangqi Fashi Lun), states: "Grains nourish, fruits assist, livestock benefit, and vegetables supplement. When consumed in harmony, they replenish essence and boost qi." This demonstrates that a balanced daily diet with appropriate proportions of grains, meat, fruits, and vegetables allows optimal absorption of food essence. Furthermore, prevention and treatment of Xiaoke should emphasize balanced flavor—avoiding biased or picky eating, ensuring comprehensive nutrition. Meals should be taken at regular intervals and in appropriate quantities; overeating and bingeing should be avoided; spicy and cold foods should be minimized; and foods that strengthen the spleen, drain dampness, and resolve phlegm—such as adzuki beans, hyacinth beans, white radish, coix seed (Job's tears), Chinese yam (Dioscorea), cucumber, and celery—should be consumed in moderation. Only in this way can total caloric intake be reasonably controlled, ideal body weight maintained, and disease progression halted.

4.2 Emotional Regulation: Avoiding Excess of the Seven Emotions

Mental and emotional factors are significant pathogenic contributors; emotional disharmony can trigger or exacerbate Xiaoke. Emotional disturbances—such as excessive worry, anger, and anxiety—disrupt the body's qi flow, causing dysfunction of the zang-fu organs, thereby acting as catalysts for Xiaoke's onset or progression. Excessive worry damages the spleen; spleen failure in transportation leads to improper distribution of food essence, which accumulates as dampness. Dampness stagnates and transforms into heat, consuming body fluids and giving rise to Xiaoke. Anger damages the liver; liver qi stagnation with impaired free-flow function disrupts the circulation of qi and blood and indirectly affects spleen-stomach function, contributing to Xiaoke. Moreover, emotional factors often intertwine with other pathogenic factors such as dietary irregularity and excessive exertion, forming a complex pathological network. For example, individuals with chronic emotional distress often lose their appetite or engage in binge eating for temporary psychological comfort—this not only damages the spleen and stomach but also generates internal damp-heat, accelerating Xiaoke progression. Similarly, extreme emotions consume heart-spirit, and combined with excessive sexual activity depleting kidney essence, the resulting water-fire disharmony makes Xiaoke persistent and difficult to cure. Therefore, both healthcare providers and family members should provide a supportive therapeutic environment, maintain timely communication, guide and dissipate negative emotions, and alleviate psychological distress.

4.3 Exercise to Strengthen the Body and Improve Constitution

The onset of Xiaoke is intimately connected with the patient's physical constitution. Lingshu (Spiritual Pivot), in the chapter "On the Internal Organs" (Benzang), states: "When the five zang organs are delicate and weak, one is prone to contracting Xiaoke." This insight profoundly reveals that the fundamental internal cause of Xiaoke lies in the weakness of the five zang functions and insufficiency of healthy qi. To prevent this disease, exercise is an indispensable remedy. Exercise promotes the smooth flow of qi and blood, strengthens zang-fu function, and enhances overall constitution, erecting a solid defense against Xiaoke. Suwen, chapter "On the Five Qi Made Manifest" (Xuanming Wuqi), also notes: "Prolonged bed rest injures qi." This emphasizes that the vitality of the limbs and muscles derives from the nourishment and regulation of the spleen. Active physical movement assists spleen transportation, promoting the distribution and utilization of food essence. Conversely, physical lethargy obstructs spleen function, preventing essence from being effectively transformed for bodily use—instead, it is lost in large quantities, undoubtedly worsening Xiaoke. Modern scientific research confirms the positive impact of exercise on Xiaoke: appropriate exercise reduces glucose intolerance, enhances insulin sensitivity, and effectively reduces vascular complications [10]. However, for Xiaoke patients, the choice and intensity of exercise must be individualized, adhering to the principle of "moderation without fatigue." Patients with milder conditions may adopt diverse approaches such as walking, daoyin (guiding-qi exercises), and dance to strengthen constitution and improve physical function. Severe patients and those with diabetic foot should prioritize rest and recuperation, appropriately reducing exercise volume to avoid unnecessary injury. Only in this way can health be preserved

while effectively preventing and controlling Xiaoke.

5. Treatment

5.1 Early Stage: Boost Qi and Strengthen the Spleen, with Clearing Heat as Adjunct

In the early stage of Xiaoke, spleen deficiency with impaired transportation is typically the root. The spleen governs transportation and transformation and is the source of qi and blood production. When spleen deficiency impairs transportation, food essence cannot be distributed throughout the body; instead, it accumulates to form dampness and phlegm, obstructing qi flow and impeding blood circulation. At this stage, patients commonly present with fatigue and weakness, poor appetite, tastelessness in the mouth, abdominal distension, and loose stools. The tongue is typically pale and enlarged with tooth-marked edges, coated with a white, greasy coating, and the pulse is soft and slow (ruo huan). As the disease progresses, Xiaoke may affect the kidney from the spleen, forming a spleen-kidney dual deficiency pattern. The kidney is the foundation of the congenital constitution, storing essence and housing primordial yin and yang; spleen function depends on the warming of kidney yang. Spleen-kidney dual deficiency further disrupts water metabolism; damp-turbidity generates internally, stagnates, and transforms into heat, scorching yin fluids and worsening the condition. At this stage, beyond the above symptoms, patients may also experience soreness and weakness of the lower back and knees, dizziness, tinnitus, frequent nocturia, vexing heat in the five centers (chest, palms, soles), or cold limbs—manifestations of kidney deficiency. The tongue may become red with scant coating or pale with white, slippery coating, and the pulse may be thin and rapid or deep, slow, and forceless.

Treatment in the early stage of Xiaoke should focus on strengthening the spleen and resolving dampness, supplemented by nourishing yin and generating fluids [11]. The modified Shenling Baizhu San (Ginseng, Poria, and Atractylodes Macrocephala Powder) may be selected: ginseng (Ren Shen), white atractylodes (Bai Zhu), and poria (Fu Ling) strengthen spleen qi; Chinese yam (Shan Yao) and lotus seed (Lian Zi Rou) assist Bai Zhu in strengthening the spleen and stopping diarrhea; amomum fruit (Sha Ren) awakens the spleen and harmonizes the stomach; platycodon root (Jie Geng) disperses lung qi, regulates water passages, carries the herbs upward, and promotes the earth-to-metal (spleen-to-lung) generation; coix seed (Yi Yi Ren) mildly drains dampness while strengthening the spleen; prepared licorice (Zhi Gan Cao) boosts qi, harmonizes the center, and moderates the actions of other herbs. The entire formula collectively strengthens spleen qi, drains dampness, and stops diarrhea. Additionally, Trichosanthes root (Tian Hua Fen), Ophiopogon tuber (Mai Dong), and Dendrobium stem (Shi Hu) may be judiciously added to nourish yin, generate fluids, and protect body fluids, preventing further disease progression.

5.2 Complication Stage: Move Qi, Activate Blood, and Unblock Collaterals

Stasis obstructing the collaterals is the pathological foundation and key factor in the development of various Xiaoke complications. Its clinical manifestations are diverse—numbness, pain, or blurred vision; palpitations—all arising from impaired blood flow and obstruction of qi and blood circulation. If not addressed promptly during Xiaoke progression, collateral-stasis will intensify, forming a vicious cycle. At this stage, treatment must prioritize activating blood, resolving stasis, unblocking collaterals, and relieving pain, while simultaneously nourishing yin, generating fluids, boosting qi, and supporting healthy qi, thereby restoring smooth qi-blood circulation and halting further complication development.

Specifically, blood-activating and stasis-resolving herbs include peach kernel (Tao Ren), safflower (Hong Hua), and Salvia root (Dan Shen), which dredge the vessels and disperse stagnation. For unblocking collaterals and relieving pain, cassia twig (Gui Zhi), mulberry twig (Sang Zhi), and star jasmine stem (Luo Shi Teng) are commonly used to free the meridians, dispel wind, and eliminate dampness, alleviating limb pain and numbness. Insect-based medicinals—such as earthworm (Di Long), white stiff silkworm (Bai Jiang Can), leech (Shui Zhi), and centipede (Wu Gong)—are also frequently employed to enhance the collateral-penetrating effect. These are particularly effective and widely used in diabetic peripheral neuropathy and diabetic gangrene of the extremities [12]. Meanwhile, addressing the root of Xiaoke requires the addition of fresh Rehmannia root (Sheng Di), Ophiopogon tuber (Mai Dong), and Astragalus root (Huang Qi) to nourish yin, generate fluids, boost qi, and support healthy qi, thereby nourishing the source of transformation and consolidating the root.

5.3 Throughout the Entire Course: Resolve Phlegm, Drain Dampness, and Regulate Constitution

Phlegm-dampness is closely associated with the onset and progression of Xiaoke, particularly in obese patients with a history of excessive consumption of fatty, sweet, and rich foods, who predominantly exhibit a phlegm-damp constitution. Therefore, resolving phlegm and draining dampness should be maintained as a fundamental therapeutic principle throughout Xiaoke treatment [13]. The formation of a phlegm-damp constitution stems not only from dietary indiscretion but also from prolonged sitting with insufficient activity and emotional stagnation. These factors disrupt the normal transformation and transportation of body fluids, causing them to accumulate into phlegm, generate internal damp-turbidity, obstruct qi flow, impair blood circulation, and ultimately become a critical pathological foundation for Xiaoke onset and progression.

In Xiaoke treatment, resolving phlegm and draining dampness is not merely symptomatic treatment but also root-level intervention. By resolving phlegm and draining dampness, the normal transformation of body fluids can be restored, the internal environment improved, and Xiaoke symptoms alleviated or eliminated. Simultaneously, this approach helps regulate the patient's constitution and reduce the risk of Xiaoke recurrence. Specifically, treatment should be tailored to the individual patient's condition, flexibly employing herbal formulas such as Erchen Tang (Two-Aged Decoction) and Pingwei San (Stomach-Calming Powder) to strengthen

the spleen, dry dampness, resolve phlegm, and move qi. Additionally, acupuncture, cupping, and other external TCM therapies may be combined to unblock meridians, harmonize qi and blood, and enhance the phlegm-resolving and damp-draining effect.

6. Conclusion

Treating Xiaoke based on the root-and-branch theory provides essential guiding principles for clinical practice. By clarifying the root-and-branch relationships of the disease, we can more accurately grasp the nature and developmental patterns of Xiaoke, thereby formulating more reasonable and effective treatment protocols. In treating Xiaoke, emphasis on treating the root—adjusting the body's yin-yang balance, nourishing the zang-fu organs, and restoring their normal functions—is key to halting disease progression. Simultaneously, according to disease evolution, timely treatment of the branch to alleviate symptoms and prevent complications is crucial for improving patients' quality of life. The application of root-and-branch theory underscores the holistic and individualized nature of TCM treatment. Through syndrome differentiation and treatment—comprehensively considering the patient's constitution, etiology, pathogenesis, and other factors—and selecting appropriate therapeutic methods, the goal of treating both root and branch simultaneously can be achieved. Furthermore, the active cooperation of patients during treatment is indispensable: reasonable diet, appropriate exercise, and a positive mental attitude all help regulate the body's qi, blood, yin, and yang, promoting disease recovery.

While treating Xiaoke based on the root-and-branch theory has achieved notable results, further research and exploration are still needed. Through deeper investigation, this theory must be continuously refined and developed to provide more precise and effective methods for Xiaoke treatment, benefiting a greater number of patients. In summary, the root-and-branch theory of the Huangdi Neijing offers invaluable insights and methodologies for Xiaoke treatment. In future clinical practice, we should continue to explore and inherit this theoretical essence, integrating it with modern medical technology to innovate and improve the Xiaoke treatment system, delivering higher-quality, more efficient medical care to patients.

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