

Professor Zan Qiang's experience in the treatment of knee osteoarthritis after stroke hemiplegia follows the theory of "bone is the backbone and muscle is the wall"

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Abstract: Based on Professor Zan Qiang's understanding of "bone is the backbone and muscle is the wall", this paper expounds that the treatment of knee osteoarthritis after stroke hemiplegia should pay equal attention to bone and muscle, and follow the theory of "tendon domination and bone subordinatiog". The disease is in the joint, closely related to the spleen and kidney, so the spleen and kidney dysfunction is the origin of the disease, emphasizing the imbalance between Ying and Wei cause it cannot nourish muscle and bone after stroke hemiplegia. The rationality and importance of the treatment of "muscle and bone equally important" provides a new idea for the clinical treatment of knee osteoarthritis after stroke hemiplegia.

Keywords: The bone is the backbone; muscle is the wall; famous doctor's experience; knee osteoarthritis; hemiplegia after stroke; Zan qiang

1. Introduction

Knee osteoarthritis (KOA) is a common complication of hemiplegia after stroke, which is the most common joint disease that mainly damages joint cartilage and gradually affects the entire joint, and can be classified as "knee paralysis" in the science of chinese medicine orthopedic trauma [1]. The pathogenesis of knee paralysis is: the loss of middle-aged and elderly people, coupled with the long-term illness and strain, ying and wei disorder, the channel coagulation, the obstruction of qi and blood, the wind and cold and wet evil take advantage of the deficiency, resulting in loss of muscles and bones [2]. The main clinical manifestations of the disease are pain and tenderness of the knee joint, limited mobility, joint deformity and enlargement, bone rubbing sensation, and muscle atrophy. At present, the treatment of stroke hemiplegia complicated by knee osteoarthritis, clinically to alleviate the patient's knee pain and improve the degree of motion as the goal. Modern medicine recommended non-steroidal anti-inflammatory drugs (NSAIDs: celecoxib capsules, ibuprofen extended release, etc.) as the main treatent, but long-term use of these drugs bring side effects, and it is palliative [3]. Traditional Chinese medicine guides the treatment of knee osteoarthritis with its unique dialectical theory, and the effect is quite fruitful.

Han Haihui [4] found that skeletal muscle plays an important role in the pathogenesis of knee osteoarthritis, so improving the function of muscles around the knee joint is more beneficial for the treatment of knee osteoarthritis. Stroke incidence population is concentrated in the elder and knee osteoarthritis is likely to occur in middle-aged and elderly patients, muscle strength is insufficient and muscle tone is reduced after stroke hemiplegia, which is easy to lead to the occurrence of knee osteoarthritis. Therefore, Professor Zan Qiang, a famous chinese medicine doctor in Shaanxi Province, advocates the treatment from the theory of "bone is the backbone, muscle is the wall". Based on the "spleen governing muscle, the kidney governing bone", Professor Zan Qiang believes that stroke hemiplegia complicated by knee osteoarthritis is more likely to occur in the middle-aged and elderly groups, and the elderly people are already deficient, coupled with the weakness of the spleen and kidney after a long period of illness, resulting in insufficient essence and blood, muscle and bone can not be nourished lead to disease. Therefore, its treatment should address both the symptoms and root, mainly to supplement the deficiency. Supplement the spleen and warm the kidney to achieve the effect of

strengthening the muscle and bone, accompanied by nourishing the liver and kidney to nourish the tendon and bone. It is effective in clinic. I had the honor to summarize the experience with the teacher, so I share it with all colleagues.

2. From "bone is the backbone, muscle is the wall" to treat the etiology of knee osteoarthritis after stroke hemiplegia

The Lingshu Meridian says: "Bones are the backbone...muscle is the wall" [5]. "Bone are the backbone" means that bone is the pillar supporting of the body; "Muscle are the wall" means that the muscle like wall, distribute in the viscera and the periphery of tissues such as bone and muscle with the role of resisting external evils. The relationship between bone and muscle complement each other. The Lingshu Meridian of Five Changes has saying: "Those who are thick and the muscle is not solid, is prone to osteoarthritis " It expounds the relationship between muscle and paralysis, whose muscle texture is sparse and strength is insufficient, wei-qi is not diffusion, so that the external evil are nostalgic, the qi and blood are stagnant, the malnutrition of bone for a long time cause paralysis. The Essence of The Medical Classics has a saying: "The kidney hides the essence, the essence produces the marrow, the marrow produces the bone...sufficient marrow produce strong bone" It explains the relationship between bone and paralysis, if the kidney is deficient, which can cause bone and marrow loss of nutrition, it eventually developed into knee osteoarthritis [6]. Professor Zan Qiang believes that the incidence of knee osteoarthritis is closely related to the strength of surrounding muscles, articular cartilage and bone. If the muscle strength is insufficient and unbalanced, it is easy to cause damage to the joint tissue, further lead to cartilage and bone damage, prone to knee osteoarthritis. The knee joint is an important fulcrum of the body's weight bearing, if the bone are stunted, affecting the activity of the knee joint, cartilage and bones are easy to wear earlier, prone to knee osteoarthritis.

Su Wen Bing Ji Qi Yi Bao Ming Ji said: "Spleen disease lead to limbs do not work." The spleen is muscle in the body, and if it is weak, the muscles are lost to nourishment. Then the muscle texture is sparse, and the six external factors which is easy to take advantage of the void and enter the bone; Su Wen • Six Verses of Tibetan Elephant Theory puts forward: "the kidney providing essence-QI to the bone" The Suwen Weilun says: "Kidney qi fervidity ... Bone withering and medulla loss, onset as osteopathy. "Kidney bone marrow, in the body for the bone, if the kidney qi is insufficient, kidney essence is deficient, then the bone is lost, the muscles and bones are not strong, and it prone to knee osteoarthritis [7]. It can be seen that knee osteoarthritis after stroke is closely related to the spleen and kidneys. The kidney is the innate foundation, the spleen is the acquired nature. If the spleen and kidney is unbalanced, the kidney do not raise spleen, the spleen do not nourish the kidney. Then the spleen and kidneys are deficient that cause muscle and bone are lost in nourishment and the disease is prone to occur. Based on the above, Professor Zan Qiang proposed the theory that the treatment of knee osteoarthritis should be "equal emphasis on muscle and bone, treatment of the spleen and the kidney together".

3. From the "bone is the backbone, muscle is the wall" on the diagnosis and treatment of knee osteoarthritis after stroke hemiplegia

Knee osteoarthritis after stroke hemiplegia belongs to the "knee paralysis" in Traditional Chinese medicine. Because of its complex disease mechanism and mixed with feeble and luxus, doctors have different views and understandings of it and there is no uniform pattern of syndrome. Li Jubao et al [8] in the past 10 y of literature, it has been found that frequency of KOA pattern of syndrome is liver and kidney deficiency, cold and wet retention, kidney and essence deficiency, qi stagnation blood stasis, damp and hot obstruction, tendon and channel stasis, spleen and kidney deficiency, yang deficiency and cold condensation, rheumatic obstruction, and qi deficiency and wet resistance. In 2020, the "Guidelines for the Diagnosis and Treatment of Traditional Chinese Medicine for Knee Osteoarthritis (2020 Edition)" issued by the Orthopaedic Trauma Branch of the China Association for the Promotion of Traditional Chinese Medicine [9] formulated five types of knee osteoarthritis: qi stagnation and blood stasis, damp and hot obstruction, cold and wet obstruction, liver and kidney deficiency, qi and blood weakness. Professor Zan Qiang concluded that knee osteoarthritis after stroke hemiplegia is mainly "liver and kidney deficiency, kidney essence deficiency, spleen qi deficiency, spleen and kidney deficiency". Now I will discuss the syndrome of kidney and essence deficiency, spleen qi deficiency, spleen and kidney deficiency of knee osteoarthritis after stroke hemiplegia from the theory of "bone is the backbone and muscle is wall".

3.1. Based on the theory of "bone is the backbone" for the treatment of knee osteoarthritis after stroke hemiplegia

"Bone is the backbone" elaborates on the close relationship between bone and muscle that it has a supporting effect on the joints. Traditional Chinese medicine believes that the bone is closely related to the function of the kidneys. The Yellow Emperor's Neijing Su Wen [10] contains the theory of "kidney main bone, generate marrow". "kidney main bone" shows that the process of bone development, degeneration and aging is closely related to the kidney; "generate marrow" points out that the kidney also dominates the production of the marrow which closely related to bone. If the kidney essence is sufficient, the yin and yang are harmonized, marrow has a source of origin, the bone content is normal, the bone is strong and powerful. If the kidney essence is deficient, the yin and yang are not harmonized, lose the source of generation, then the bone disease is born. As in the "Su Wen Ni Diao" [11], it is said: "a human being, kidney qi exuberant ... if the kidneys are not strong, the marrow cannot be full... The name of the disease is Pa disease, joint clonic. Therefore, Li Ning [12] and others believe that the whole process of bone generation, growth and metabolic absorption depends on the subtle nourishment of the kidneys and the promotion of the yang qi of the kidneys.

The kidney is the innate foundation which has the dominant of bone to generate the marrow. And the kidney essence is sufficient to can produce bone. The Ancient Na vet é says: "... The kidney qi is strong, and the muscles and bones are strong." [13] It shows that when the kidney qi is full, the muscles and bones are strong and powerful. If the kidney qi is deficient and lacking in the marrow, the joint pain and activity are unfavorable. Therefore, Professor Zan Qiang believes that the activity of the knee joint depends on the strength of the muscles and bones. Patients with hemiplegia after stroke are prone to kidney essence deficiency due to long-term illness, kidney essence can not produce bone, muscles and bones lost in nourishment, the knee joint is prone to pain and discomfort and the movement is limited. Professor Zan Qiang pointed out that the knee osteoarthritis after stroke hemiplegia belongs to kidney essence deficiency, mostly with joint pain, the waist is sour and the legs lack strength, fatigue and forgetfulness, light tongue and less moss, deep and thin pulses. Use knee joint No. 1 (clinical experience), its composition is: Aconite, Cinnamon, Radix Rehmanniae Praeparata, Cornus, Eucommia Ulmoides, Deer-horn Glue, Medicinal Cyathula Root, Rhizoma Drynariae, Cortex Acanthopanax, Lycopodium Clavatum, Herba Siegesbeckiae, Ramulus Mori, Radix Aconiti, Liquorice. Aconite, Cinnamon and Radix Rehmanniae Praeparata are monarch drug to nourish Yin and Yang, tonifying the kidney and beneficial essence. Cornus, Eucommia Ulmoides, Deer-horn Glue and Medicinal Cyathula Root are ministerial drug to nourish the liver and kidney, strong waist and knee. Rhizoma Drynariae, Cortex Acanthopanax, Lycopodium Clavatum, Herba Siegesbeckiae, Ramulus Mori and Radix Aconiti are assistant to fill the kidney, strong tendon and bone, relieve joint pain. Liquorice is guide drug to coordinating all of drug. All of those drugs have effect of nourish Yin and Yang, tonifying the kidney and beneficial essence, strong tendon and bone and relieve joint pain.

3.2. Based on the theory of "muscle is the wall" for the treatment of knee osteoarthritis after stroke hemiplegia

"Muscle is the wall " elaborates on the close relationship between muscles, tendons and bones, and muscles have the effect of protecting. The medicine of the motherland believe that muscles have a close connection with the internal organs and the spleen is particularly important which has the effect of maintaining the normal function of muscles. The Qing Dynasty physician Huang Yuanyu wrote in the Four Sacred Heart Sources: "The muscles...spleen qi nourish the muscle. " [14] It discuss the connection between muscles and spleen qi, the spleen nourishing the muscles, make it solid and full. The spleen is the root of after-birth and it main limb muscles. If the muscles are not strong, the tendons and bones are not work.

Professor Zan Qiang believes that the activity of the knee joint is closely related to the strength of the soft tissues around it. And if the balance of the surrounding soft tissue forces is normal, knee joint movement is normal. If it is unbalanced, it is easy to cause joint cartilage damage. And over time, the knee joint has symptoms such as pain and limited mobility, it is easy to develop knee osteoarthritis. In "Su Wen Tai Yin Yang Ming Theory" [15], the emperor said: "Spleen disease lead to limbs could not move properly, why?" Qi Bo has saying: "Four limbs receiving qi from the stomach ... limbs can not be nourished by cereal essence. " It also confirms Professor Zan Qiang's view, clearly pointing out that the activity of the limbs depends on the filling of the essence of stomach. The essence of the stomach is sufficient, the muscles can be solid, and bone flexion and extension are powerful. The subtlety of the water valley of the stomach cannot be directly spread on the limbs, it need to be transferred through

spleen qi and reach the limbs. If the spleen disease cannot spread the subtlety of the water valley for the stomach, the limbs cannot be nourished, the tendons and muscles are weak. Patients with stroke hemiplegia sequelae are mostly deficient in spleen qi, resulting in lack of qi and blood, muscles can not be nourished, muscle strength is insufficient, resulting in tendons and bones can not work and prone to knee osteoarthritis complications. Most patients with this type of syndrome are mainly suffering from joint soreness and discomfort, fatigue, dizziness, pale tongue and moss thin white, deep and thready pulse. Therefore, Professor Zan Qiang often based on the theory of "muscle is the wall", "treatment from the spleen" to treat patients with knee osteoarthritis after stroke hemiplegia of deficient in spleen qi in order to enhance muscle strength and reduce patient pain and other symptoms. The choice is mostly to use Yiqi Jian Pi Prescription (from "Shou Shi Bao Yuan") with the addition of unblock the joint medicine. Ginseng is monarch drug to reinforce vital energy. Atractylodes, Rhizoma atractylodis, Poria Cocos are invigorating the spleen and removing dampness. Radices Paeoniae Alba are ministerial drug to nourishing the blood and reconciliation Ying. Ligusticum wallichii promotes blood circulation and qi. Lycopodium Clavatum, Ramulus Mori, Herba Siegesbeckiae, Parasitic Loranthus and Rhizoma Homalomenae are assistant to strengthen the bones and tendons, dredge the channel and joint. Licorice is guide drug to coordinating all of drug. All of those drugs have effect of supplementing qi and blood, dredge the channel and joint, relieve pain.

3.3. Based on the theory of "bone is the backbone, muscle is the wall" for the treatment of knee osteoarthritis after stroke hemiplegia

The theory of "bone is the backbone, muscle is the wall" elaborates the relationship between muscle and bone, and the two interact and complement each other. That is, the bone provides support for the muscle and the muscle plays a protective role for the bone. The spleen is the foundation of the acquired to nourish the muscles; the kidney is the innate foundation to nourish the bones, they breed and promote each other [16]. The function of the kidney need the subtle nourishment transported by the spleen [17]; The function of the spleen need the warm and steaming of the kidney Yang. Together to promote yin and yang, qi and blood harmony. As stated in the Yellow Emperor's Inner Classic: "If don't treat, the disease of the spleen transfer to the kidney", so if any of the spleen and kidney are out of order, the other organ will suffer after a long time. Therefore, dys-splenism lead the essence metaplasia lack of source, long-term illness can cause kidney deficiency. Symptoms are soreness of waist and knee, bone impotence and other symptoms. Kidney yang weakness, fire does not warm the soil lead to spleen yang weakness and muscle lack strength and other symptoms.

Professor Zan Qiang believes that the knee osteoarthritis after stroke hemiplegia is mostly middle-aged and elderly. The patients' essence gradually declines and qi blood are deficient, so the prognosis is more than bad. The sequelae period is mostly spleen and kidney disorders. The kidney is the innate basis and the spleen is the acquired basis. They are closely related, so the spleen and kidney deficiency are mostly common manifestations of hemiplegia complicated by knee osteoarthritis after stroke. The main symptoms are joint pain, waist and knee soreness, fatigue and inability to walk. Choosing the knee joint No.2 (clinical experience). Its composition is: Ginseng, Astragalus Mongholicus, Monkshood, Cinnamomum Cassia, Poria Cocos, Dodder, Eucommia Ulmoides, Bighead Atractylodes Rhizome, Chinese Yam, Fructus Corni, Matrimony Vine, Angelica Sinensis, Parasitic Loranthus, Cyathula capitata Moq., Radix Angelicae Tuhuo, Radix Aconiti, Radix Aconiti Agrestis, Ramulus Mori, Herba Siegesbeckiae, Lycopodium Clavatum. Ginseng, Astragalus Mongholicus, Monkshood, Cinnamomum Cassia and Poria Cocos are monarch drug to nourish the spleen and warm the kidney. Dodder and Eucommia Ulmoides have effect of supplement the liver and kidney, strong waist and knee. Bighead Atractylodes Rhizome and Chinese Yam play the effect of strengthening the spleen and eliminating dampness. Fructus Corni, Matrimony Vine, Parasitic Loranthus and Cyathula capitata Moq. are ministerial to nourish kidney essence. Angelica Sinensis enrich and invigorate the circulation of blood. Ramulus Mori, Herba Siegesbeckiae, Lycopodium Clavatum have the function of easing joint movement. Radix Angelicae Tuhuo, Radix Aconiti and Radix Aconiti Agrestis are assistant to relieve pain. All of those drugs have effect of invigorating spleen, tonifying kidney and relieve pain.

4. Cases

Initial diagnosis (October 6, 2020): Li Mou, male, 62 years old, the patient reported that he suddenly fainted without obvious reasons 1 year ago, his mouth and tongue were oblique, right limb could not move, accompanied by unfavorable speech, nausea and vomiting. He was diagnosed as "hemorrhagic stroke" and left right limb weak after discharge. Because of knee pain and limited movement 1 week ago,

He go to the outpatient clinic of our hospital. Present symptoms: weakness of the right limb, pain and limited movement of the right knee, waist and knee soreness, chills, dizziness, occasional chest tightness, non-appetite, loose stool, frequent urination at night, clear urine in large amounts, the tongue is light and indentation, the moss is white greasy, deep and smooth pulses. Diagnosis: knee osteoarthritis after stroke hemiplegia, dialectical as spleen and kidney yang deficiency, treatment to warm spleen and kidney, unclog the joint. Chooseing the knee joint No. 2 plus or minus: Ginseng 15g, Astragalus Mongholicus 40g, Monkshood 6g, Cinnamomum Cassia 10g, Poria Cocos 12g, Dodder 12g, Eucommia Ulmoides 12g, Bighead Atractylodes Rhizome 20g, Chinese Yam 15g, Fructus Corni 12g, Matrimony Vine 15g, Angelica Sinensis 15g, Parasitic Loranthus 15g, Cyathnla capitata Moq. 15g, Radix Angelicae Tuhuo 12g, Radix Aconiti 10g, Radix Aconiti Agrestis 10g, Ramulus Mori 15g, Herba Siegesbeckiae 12g, Lycopodium Clavatum 12g. 12 doses, decoction 400ml in water divide in the morning and evening, one dose a day. Patients are instructed to take medication on time and undergo limb function training to help strengthen muscles and speed up recovery.

Subsequent visit (October 18, 2020): After taking 12 doses, the patient returned to the outpatient clinic of our hospital, the pain in the right knee joint improved but still felt that the movement was slightly restricted. The weakness of the right limb was slightly reduced with the waist and knee soreness, chills, slightly loose stool, tongue is pale with white coating, tooth marks, deep and fine pulses. Through dialectical treatment, above the prescription added Rhizoma Zingiberis 10g, Cloves 10g, Dodder and Eucommia Ulmoides increased to 15g, 7 doses, decoction 400ml in water divide in the morning and evening, one dose per day. Advise patients to be comfortable. On November 5, 2020, the telephone follow-up, there was no obvious pain in the right knee joint, the weakness of the right limb was greatly improved, and the waist and knee soreness appeared after exertion and were significantly reduced, and there was no other discomfort.

5. By word

The patient's disease belongs to knee osteoarthritis after stroke hemiplegia which subordinate to the "atrophic debility of bones" disease of the Department of Orthopedics of Traditional Chinese Medicine. Who is evidence of spleen and kidney deficiency. Middle-aged and elderly men's spleen and kidney yang qi are prone to deficiency coupled with the lingering and difficult to heal, further damage to the spleen and kidney yang. Spleen and yang loss cause inability to transport water and essence. Muscles can not be nourished and muscle's useless lead to bone disability; kidney yang damage, yin and yang are not balance and kidney essence can not be filled, then the bone can not be born. There is knee pain, accompanied by the waist and knee soreness, chills, slightly loose stool and other symptoms. The dialectic of this disease must not be blinded by one leaf, only focusing on the deficiency of spleen yang and not seeing the deficiency of kidney yang, and vice versa. Therefore, it should hit the disease pathogenesis and warm the yang of the spleen and kidneys, then use the knee joint No. 2 plus or minus. Ginseng, Poria Cocos, Astragalus Mongholicus, Bighead Atractylodes Rhizome play the effect of improving qi, the spleen and eliminating dampness; Chinese Yam, Fructus Corni, Matrimony Vine play a concerted role in nourishing the kidney yin, the spleen and the liver; Monkshood, Cinnamomum Cassia warm the kidney yang; Dodder, Ulmoides, Parasitic Loranthus, Cyathnla capitata Moq. supplement the liver and kidneys, strengthen the waist and knees; Angelica sinensis invigorate blood; Ramulus Mori, Herba Siegesbeckiae, Lycopodium Clavatum unclog the joint; Radix Angelicae Tuhuo, Radix Aconiti, Radix Aconiti Agrestis perform pain relief effects. At the second diagnosis, the patient's pain improved. But there is still the disease of Yang deficiency, so added Rhizoma Zingiberis and Syzygium Aromaticum; The patient's clear urine in large amounts. Added Dodder, Eucommia Ulmoides to achieve the effect of warming the kidney yang and reduce urine. In addition to the medication after the disease, we should also pay attention to the prevention of the disease. For patients after stroke hemiplegia, the patient's functional exercise should be strengthened, muscle strength should be improved and the occurrence of complications of knee osteoarthritis should be prevented. Teacher Zan Qiang believes that if the patient's muscle strength is sufficient, the incidence of knee osteoarthritis will be reduced. While treating with drugs, he recommend that patients choose the exercise method of Baduanjin and Simple Taijiquan which can relieve knee pain, stiffness, improve function and enhance patients' muscle strength and balance.

6. Conclusion

In the physiological state, the muscles are attached to the bones, the bones support the muscles. The kidney and the spleen are in a relationship of postnatal and congenital, which determines the relationship

of "equal weight of muscle and bone". Knee osteoarthritis after stroke hemiplegia is a combination of post-stroke hemiplegia and knee osteoarthritis which is closely related to the spleen and kidney. So the treatment can be based on the theory of "bone is the backbone, muscle is the wall", Zan Qiang teaches the viewpoint of "equal weight on muscle and bone" and "spleen and kidney supplementation". And from the observation of clinical efficacy, the method of warming spleen and kidney can not only play a certain role in knee osteoarthritis, but also have a certain effect on the sequelae of hemiplegia after stroke, which can improve the muscle strength and numbness of the affected side. This reflects the overall dialectical view of Chinese medicine thinking, people are an organic whole. The treatment of diseases must be based on the basis and not limited to one side which should be examined as a whole. In clinical practice, I have observed the feasibility of the theory of "bone is the backbone, muscle is the wall". The strong efficacy of musculoskeletal treatment of knee osteoarthritis after stroke hemiplegia is emphasized. I hope that by sorting out the clinical ideas and views of Teacher Zan to open up a new path for the treatment of knee osteoarthritis after stroke hemiplegia.

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