

Progress of Clinical Research on the Treatment of Chronic Kidney Disease based on Kidney Collateral Theory

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Abstract: *Chronic kidney disease (CKD) is a common chronic disease in clinic, and medical practitioners of all times have made unremitting explorations on its pathogenesis as well as its treatment, and kidney collateral theory is one of them. Due to the accumulation of various pathological factors in the kidney collateral, the kidneys are damaged to different degrees. Most doctors believe that chronic kidney disease is characterized by renal deficiency and stagnation of the renal channels, so the two methods of “Dredging” and “tonifying” are the key to the treatment of this disease.*

Keywords: CKD, Clinical research, Chronic kidney disease, Kidney collateral theory.

1. Introduction

Chronic kidney disease (CKD) is a health-affecting disease in which structural or functional abnormalities of the kidneys persist for more than 3 months and are clinically characterized by decreased estimated glomerular filtration rate (eGFR), metabolite retention, and water-electrolyte and acid-base imbalances [1]. Epidemiologic surveys have found that CKD currently affects 500 million or more people worldwide [2]. CKD is largely responsible for end-stage renal disease (ESRD), which causes nearly 1.2 million deaths each year [3]. CKD imposes a heavy economic burden on society, families and individuals, and has become an important public health problem faced by countries around the world.

Chronic Kidney Disease (CKD) is equivalent to “edema”, “asthenia”, “kidney fatigue”, “scrotal obstruction”, “Guange”, etc. in Chinese medicine. Chinese medicine has unique advantages in slowing down the progression of CKD and improving patients’ quality of life. As an important theory of disease mechanism in Chinese medicine, the theory of the collaterals guides the clinical treatment of a variety of diseases. Complex veins, as opposed to “meridians”, refer to the network of collateral branches or small branches of the body’s Qi and blood flow channels. The channels are located all over the body, including the kidneys, which are known as the kidney channels. As the operation of Qi and blood, connecting internal and external, communicating up and down the channel, the veins are most vulnerable to disease and evil invasion, by a meridian extended to the corresponding visceral lesions, the renal network is also the case. The human body suffers from external evil attack, the evil by the meridian into the complex, the long run of the Qi is not smooth, “gas for the blood of the marshal”, gas deficiency blood line is not smooth, or cold coagulation and blood stasis, or wet obstruction of the complex, or phlegm stasis in the channel, the channel in the qi, blood and fluid distribution is blocked and lead to the damage of the channel [4]. As Ye Tianshi said in the “Clinical Guidelines for Medical Cases”, “the main meridian gas, the main blood, blood stasis in long-term disease”. From the aspect of kidney channels, evil Qi in the meridians for a long time, resulting in the

accumulation of stasis of blood, turbid toxins, etc., the kidney channels are not nourished, and the normal physiological function of the kidneys is impaired.

2. Interpretation of the Cause

Historically, medical doctors of all generations have made rich and profound discussions on the pathogenesis of kidney disease. Emphasizing kidney deficiency as the basis, water-dampness stasis and toxicity as the standard. “The kidney is the master of water, the Division of opening and closing”, “the kidney, the stomach of the gate is also, closing the door is not favorable, so the gathering of water from its class also”, the kidney presides over the body’s fluid metabolism, if the kidney gas is insufficient, “opening and closing out of the Division”, resulting in the flooding of water, resulting in edema. Lead to the flooding of water, the formation of edema. And kidney yang for the root of life, “Jing Yue Quan Shu”: “the five organs of the sun, not this can not send.” Kidney yang is weak and weakened, then the warmth is out of duty, appearing cold, cold limbs, frequent urination at night and so on. When kidney Qi is weak for a long time, pathological factors such as water-dampness, stasis and toxicity accumulate in the kidney complex, which leads to the progression of the disease. Therefore, all stages of chronic renal failure are accompanied by different degrees of “renal stasis” performance, kidney deficiency for this, phlegm, stasis and toxic stagnation in the renal network for the standard. Modern medical research has proved that a series of pathological changes of chronic kidney disease, such as glomerulosclerosis, interstitial fibrosis and so on, are closely related to renal collateral stasis [5]. Therefore, from the point of view of the pathology of the kidney channel and the pathogenesis of the internal organs, academician Wu Yiling firstly mentioned the kidney channel disease in the study of channel disease, pointing out that it is easy to stagnate, which is equivalent to the modern chronic kidney disease, and the main causes of the disease are the six external evils, diet and fatigue, stasis of blood, phlegm, water-dampness, turbid toxins and other stagnation and damage to the channel, or the deficiency of positive Qi and the disease of long standing into the channel [6].

2.1 Wind-dampness Disturbing the Kidneys

According to Huang Yong et al. [7], wind-dampness is the initiating pathological factor of chronic kidney disease, and the evolution of its disease involves cold, heat, turbidity, stasis, water, and toxicity, and the pathology, though mixed, is causal to each other, so “wind-dampness disturbs the kidney” and “the kidney complex is out of harmony” is the key link in the complex pathological stage of chronic kidney disease. In the treatment of renal amyloidosis and membranous nephropathy, Professor Yang Hongtao analyzed the appearance of persistent proteinuria as a manifestation of wind-dampness disturbing the kidney [8].

2.2 Blood Stasis and Obstruction

According to Prof. Liu Guangzhen, stasis is the key to many diseases. Kidney diseases are often prolonged for a long time, and the evidence of blood stasis and obstruction of the kidney complex can be seen, or even the formation of kidney microchemistry in the abdomen [9]. Prof. Qin Jianguo pointed out that the stasis and damage of the kidney complexes, and then injure the kidney yin and yang essence, drowning and stagnation of toxins, and the emergence of all kinds of diseases, so it can be seen that “stasis and damage of the kidney complexes” is the core of the disease mechanism of the occurrence and development of CKD [10].

2.3 Toxic Damage to the Kidney Complex

Professor Nan Zheng firstly summarized the pathogenesis of diabetic nephropathy as “toxic damage to the kidney network”, and he believed that toxicity runs through the whole process of diabetic nephropathy and is the initiating factor of its complications, and toxicity is the key to the pathogenesis of diabetic nephropathy. Dai Enlai [11] believes that, from the perspective of Chinese medicine theory, coagulation, fibrinolysis, kinetic state, inflammation and other factors mediated by the immune response leading to endothelial damage of the renal vasculature are all “poisonous evil”, visceral disorder, all evils for a long time, change into poisonous. Prof. Sun Xinyu [12] also believes that poison is easy to stagnate deeply in the kidney in the Fu Luo, Sun Luo, coupled with virtual, depression, stasis, phlegm and other factors, damage to the kidney body depletion of kidney Qi, and ultimately kidney deficiency. Prof. Xie Guiquan [13] believes that the spleen and kidney deficiency, turbid toxicity within the chronic renal failure for the identification of the mechanism, turbid toxicity for a long time, coupled with the spleen and kidney Qi deficiency, and further phlegm can be condensed into stasis, phlegm and stasis agglomeration of the kidney, the formation of renal micro-crucial accumulation.

2.4 Prolonged Illness in the Collateral, Stasis in the Kidney Collateral

Niu Lina et al [14] that, chronic kidney disease is not cured for a long time, and there are many collateral diseases, which lead to kidney collateral damage, gasification is unfavorable, Qi and blood operation is not smooth, blood stagnation and stasis, fluid transmission and distribution of the failure of the Kidney collateral paralysis blockage, veins and collaterals loss of nourishment, the water stops to become phlegm, Qi and blood

stasis, phlegm and stasis of each other, the disease is further lingering difficult to cure, with a “long-term disease into the collateral”, “long-term disease will be stasis” development process. Yao Ningshun [15] and other think, kidney hide yuan yang, kidney yang insufficiency, easy to produce internal cold, cold is the blood congealed not smooth, plus the kidney collateral tortuous, further congestion of veins; on the other hand, the late stage of the disease repeated, the positive Qi depletion, and thus dampness and heat, blood stasis, phlegm, and other evils, long entrenched into a poison, toxic invasion of the kidney, the kidney and the network of the loss of harmony. According to Prof. Cao Shili, the disease of chronic kidney disease is mainly located in the kidney collateral, and the stagnation or deficiency of the kidney collateral is the key to the disease, in which pain, paralysis, crux, edema, bleeding and so on are the core features of the disease of the kidney collateral [16].

3. Treatment Methods and Prescriptions

Although the original etiology, pathological types and clinical manifestations of renal channel diseases vary, their pathological changes mainly involve the two key links of “deficiency” and “stasis”. Chronic kidney disease is characterized by deficiency of the spleen and kidney as the root cause and obstruction of the kidney channels by wind, dampness, toxins and stasis as the symptoms, therefore, the basic treatment principles of “circulation” and “tonic” can be used throughout.

3.1 Tonic

Chronic kidney disease is mostly due to the body’s deficiency of positive Qi, so that the function of the internal organs and produced by the deficiency, the disease is located in the kidney, kidney deficiency is the intrinsic basis of its onset, clinically common kidney deficiency and spleen, i.e., the spleen and kidney deficiency, so that the kidney is empty, the loss of glory and nourishment, so in the process of treatment, especially to focus on the “tonic” method, that is, tonifying the kidney, strengthening the spleen, in order to achieve the principle of supporting the positive and solidifying the root. Therefore, in the course of treatment, special attention should be paid to the “tonic” method, i.e. tonifying the kidney and strengthening the spleen, in order to achieve the principle of strengthening the root. According to Prof. Zhang Daning [17], the core of chronic kidney disease is kidney deficiency and blood stasis, with kidney deficiency being the main cause in the early stage of the disease, developing into spleen and kidney deficiency in the middle stage, and phlegm and blood stasis in the late stage. Professor Zhang Daning suggested that tonifying the kidney and activating the blood should be the main treatment method. In the early stage of the disease, tonifying the kidney should be the main treatment method, and Astragalus should be used; in the middle stage of the disease, the spleen and kidney should be tonified together; in the late stage of the disease, activating the blood and removing blood stasis should be the main treatment method, and supplemented by removing phlegm and dampness. Professor Huang Chunlin [18] summarized that in the process of diagnosis and treatment of chronic kidney disease, it is advocated to nourish the nurture by replenishing the nature, and to help the nature by nourishing the nurture, so as to make

the spleen and kidney organs promote and support each other together.

3.2 Circulation

3.2.1 Resolving Blood Stasis and Clearing Blood Vessels

Prof. Dai Enlai [19] believes that, in terms of the etiology of blood stasis, it is no more than the two ends of the spectrum of emptiness and reality. For those who have blood stasis due to dampness-heat, it is appropriate to clear away heat and diuresis, and activate blood circulation to remove blood stasis, and the formula is Yishen Soup with flavoring; for those who have water obstruction to blood stasis, it is appropriate to diuresis water to eliminate edema, and activate blood circulation to remove blood stasis, and the formula is Wuling San or Danggui Shaoyao san with the formula for removing blood stasis; and for those who have dampness- turbidity, it is appropriate to clear away heat, activate dampness and remove blood stasis. For those with blood stasis due to dampness and turbidity, the treatment is to promote dampness and eliminate turbidity, activate blood circulation and eliminate blood stasis, and the formula is Huanglian Wengdian Tang combined with stasis-eliminating herbs with added flavor; for those with blood stasis due to Qi deficiency, the treatment is to benefit Qi and eliminate blood stasis, and the formula is Buyang Huanwu tang combined with stasis-eliminating herbs with added flavor; for those with cold stasis due to yang deficiency, the treatment is to warm yang and eliminate blood stasis, and the formula is Jisheng Shenqi Tang combined with stasis-eliminating herbs with added flavor; for those with heat stasis due to yin deficiency, the treatment is to nourish yin and eliminate blood stasis, and the formula is Zhibai Dihuang Tang combined with stasis-eliminating herbs with added flavor; for those with stagnation of Qi and yin, the treatment is to For those with deficiency of both Qi and yin, the treatment should be to nourish yin and eliminate stasis, and the formula should be to add flavors of Shenqi Dihuang tang combined with stasis-eliminating drugs. Zhou Jin [20] often used blood-activating and eliminating drugs to treat chronic kidney disease in his clinic, and commonly used formulas such as Xuefu Zhuyu Tang, Buyang Huanwu tang, Taohong Siwu Tang, and Shaofu Zhuyu Tang, as well as traditional Chinese medicines such as ezhu, sanleng, chickweed vines, jixuecao, rhubarb, chuanxiong, danshen, etc., which had a better therapeutic effect.

3.2.2 Dispel wind dampness and clear the channels

Prof. Zhao Yuyong [21] added rattan medicines, such as Qingfengteng, Leigongteng, Jixueteng, Luoshiteng, Haifengteng, and Rendongteng on the basis of the experience soup named Jiangzhuo Tongluo Fang(15g of Buffalo horn, 20g of Poria, 10g of Atractylodes macrocephala, 20g of Tufuling, 30g of Astragalus, 10g of Cicada metamorphosis, 10g of Jiangcan, 12g of Dilong, 6g of Rhizoma Rheum, 30g of Jinquegen, 15g of Lanternflower, 15g of Fanbaicao, 15g of Liuyuexue, and 15g of Bixie), It can dispel wind and dampness, disperse knots and pass through the collaterals; it can also add zhuling, zexie, coix seed, peilan, cypress and other medicines on the basis of the formula of descending turbidity and passing through the collaterals, taking the meaning of wuling-san and zhuling tang, which can promote

dampness and flow of water, and lower the fat and remove turbidity. For patients with regurgitation, nausea, vomiting, add half-sia, Chen Pi, etc., so that the whole formula can eliminate the phlegm-dampness of the spleen and the turbid-dampness of the kidney.

3.2.3 Detoxify and clear away clogged blood

Sun Lingbiao adopts the “method of transforming toxins” to treat various stages of CKD. For the evidence of internal immersion of toxins, spleen and kidney deficiency and decline, the formula uses Zhenwu Tang and Shipi Yin with additions and subtractions; for the evidence of toxicity immersion and water-dampness internal impregnation, the formula uses Wu Pi Yin and Weiling Tang with additions and subtractions; for the evidence of damp-heat toxicity and immersion in gastric and internal organs, the treatment of transforming toxins to drain turbidity and stomach to stop vomiting uses Huang Lian Wendan Tang with additions and subtractions.

3.3 Focused Use of Special Types of Drugs

3.3.1 Insects

Professor Liu Guangzhen [22] believes that the insect medicine is good at attacking and walking, searching and eliminating evil, can follow the meridian into the collaterals, searching and eliminating the hidden evil in the collaterals, often combined with the cicada metamorphosis, stiff silkworms, scorpions, snake, etc. Searching and eliminating the internal and external wind, leeches, dilong, tubiechong, centipedes, etc. Eliminate blood stasis and eliminate the crux of the matter, diuresis and edema, chantui, buffalo horns, etc., clearing the heat and removing the toxins, the therapeutic effect is remarkable. Some clinical studies have also shown that leech compound preparation for the treatment of chronic glomerulonephritis can improve patients' clinical symptoms, reduce proteinuria and hematuria, and protect renal function by inhibiting thrombin to reduce blood viscosity and dissolve thrombus [23]. Ma Lijuan et al. [24] treated 60 cases of chronic glomerulonephritis with insect medicines (leech 6g, wushao snake 8g, one centipede) together with the basic prescription of chronic nephritis (Codonopsis 15g, Atractylodes Macrocephalae 12g, Poria 18g, Astragalus Membranaceus 30g, Dihuang 12g, Zexie 15g, Lianqiao 18g, Dangshen 24g) with the total effective rate of 93.3% on the basis of identification of symptoms.

3.3.2 Rattan medicine

Vines are commonly used in traditional Chinese medicine, including Lei Gong Teng, Qing Feng Teng, Lonicera japonica, Luo Shi Teng, Shouwu Teng, and Jixue Teng. The Compendium of Materia Medica clearly states: “The genus of vines can pass through the meridians and enter the collaterals”. It can be used to remove diseases and evils, and can also be used as a medicine to lead the medicines directly to the place of disease, commonly used in the treatment of diseases of the collateral. Liu Yuning et al. [25] suggested that rattan has the effect of activating blood circulation and removing blood stasis, tonifying deficiency and glorifying collaterals, searching for wind and picking out evils, and detoxifying

collaterals. Prof. Yang Hongtao [26] attaches importance to the method of dispelling wind and dampness, especially focusing on the use of rattan drugs and insects on the basis of dispelling dampness and strengthening the spleen. Clinically, it is commonly used to dispel wind and dampness, and remove paralysis through the collaterals, such as Luo Shi Teng, Lonicera japonica, Qingfengteng, and Weilingxian. Professor Ding Ying [27] often combines rattan drugs with heat-clearing and blood-stopping formulae, and believes that most rattan drugs have the function of activating blood circulation, removing blood stasis and clearing collaterals, e.g., blood-nourishing and removing blood stasis and clearing collaterals are Jixue Teng and Yejiao Teng, and the double regulation of Qi and blood and the removing of blood stasis and clearing collaterals are Jishi Teng and Haifeng Teng; and the removing of blood stasis and clearing of heat and clearing of collaterals to alleviate pain are Lonicera and Luoshi Teng. Purpura nephritis can be applied to all cases with stagnation of kidney channels.

3.3.3 Salty medicine

“Su Wen - Jin Gui true speech” has the cloud, “the north black, into the kidney..... its flavor salty.” Among the salty medicines, seaweed, kombu, turtle shell, oyster, and dilong have been used for a long time in the clinical practice of chronic kidney disease and have clear therapeutic effects, which are listed in the common prescriptions by many famous domestic experts in kidney disease. Prof. Wang Yaoxian [28] prefers to combine oyster, turtle shell and seaweed to achieve the purpose of softening and dispersing the lumps and treating the “obstruction in the kidney”. Among the salty herbs, leeches, grubs, and cuttlebone can be used to treat chronic kidney disease with “stasis and blood stagnation” to eliminate the stagnation and obstruction of the kidneys and break the stagnation and stagnation of the blood stagnation and toxicity. Prof. Ren Jixue [29] often used vinegar oyster and kombu and other cold and salty medicines to soften and drain the turbidity to lower the blood creatinine and urea nitrogen, and combined with turtle shell to nourish yin and tonify the kidneys.

4. Wrap-up

Chronic kidney disease, as a disease with a long and complex course, has a significant impact on patients and families, and Chinese medicine treatment for chronic kidney disease has unique advantages and remarkable efficacy. As an important theory of disease mechanism, kidney collateral theory can effectively improve clinical symptoms and renal function, and slow down the process of renal failure, which provides a new way of thinking for the treatment of chronic kidney disease in Chinese medicine.

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