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Analysis of the Effect of Traditional Chinese Medicine in Treating Urinary Calculi

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Abstract: In order to provide more theoretical basis for the treatment of urinary calculi with traditional Chinese medicine, this paper lists in detail the traditional Chinese medicine, the formula of traditional Chinese medicine and its pharmacological effects for the treatment of urinary calculi. Referring to the relevant literature at home and abroad, this paper classifies and summarizes the single traditional Chinese medicine or traditional Chinese medicine prescriptions that can treat urinary calculi in traditional medicine, and analyzes the internal components that play a relevant role in drugs. There are many traditional Chinese medicines commonly used in the clinical treatment of urinary calculi, such as Lysimachia christinae, chenneijin, haijinsha, Achyranthes bidentata, Shiwei, plantain, and many other traditional Chinese medicines. Traditional Chinese medicine can effectively reduce the incidence of urinary stones and promote the discharge of urinary stones.

1. Introduction

Urinary calculi is a common disease in surgery, especially frequently in urology, with high occurrence rate in ancient literature. As early as in The Yellow Emperor's Inner Canon and Classic on Medical Problems and other ancient famous medical records, it is caused by stone obstruction of urethra, and early called "urolithiasisr". Traditional Chinese medicine, such as "Diagnosis and Treatment of Similar Syndromes" said: "... Bladder generates heat, so small amounts of water are astringent and not beneficial", that" urolithiasisr" is mainly Bladder gasification and loss of function, followed by accumulation of dampness and heat, eventually leading to stone formation over time. The activity of stones, damage to the urinary tract pipeline, it is painful, restless.

Modern medicine in China believes that the occurrence of urinary calculi is inseparable from gender, gene, physical quality, family and regional eating habits, water consumption, urine pH, weather, season, regional environment, etc [1].Relevant literature research found that the incidence and recurrence rate of urinary calculi increased year by year, and the number of patients who needed drugs or surgery also increased year by year. The current data research found that the number of patients who needed hospitalization could reach 20%[2].In terms of modern medical research, the commonly used western medicine drugs for the treatment of urinary calculi are α Receptor blockers, calcium channel blockers, etc.Extracorporeal shock wave lithotripsy (ESWL) was used if the stone location was higher and less than 1cm.In this way, the probability of one-time complete stone clearance is uncertain, and multiple extracorporeal shock wave lithotripsy will cause

irreversible damage to the ureter; Percutaneous nephrolithotomy (PCNL) has high requirements for patients' physical quality, and the operation cost is large, the operation risk is high, and the kidney damage can not be ignored; Ureteroscopic lithotomy (URL) still has problems such as postoperative stone residue, postoperative hematuria, urinary tract infection, stone recurrence and so on. In the long run, surgical treatment is still inevitable for problems such as stone residue, stone recurrence, ureteral stenosis, renal function decline and so on［3-8］.Many studies have shown that traditional Chinese medicine can effectively complement the short board of surgical treatment in the treatment of urinary calculi, reduce the probability of residual and recurrence of calculi, protect the renal function of patients, prevent and treat urinary tract infection, shorten the hospitalization time of patients, and the medicine is simple and effective [9].

The evidence of single traditional Chinese medicine in treating calculus is conclusive

1.1 Lysimachia christinae

Money grass taste sweet, light, salty, slightly cold, in the twelve classics belonging to the liver, gallbladder, kidney, bladder meridian. Modern pharmacological studies show that flavonoids, amino acids, phenolic acids are the main chemical components of grass [10], among which flavonoids are the main components [11]. Tao Tingting [12] et al. have proved that The total flavonoids in Lysimachia japonica can inhibit the formation of stones, especially calcium oxalate stones, thereby reducing the probability of stone formation or inhibiting the growth of small stones, protecting kidney and ureteral function [13-14].

1.2 membranes of chicken gizzards

The golden nature of chicken is sweet and flat. It belongs to the spleen, stomach, small intestine and bladder meridians in the twelve meridians. In many medical classics, such as compendium of Materia Medica, materia medica of various schools in Japan, and the classics of Materia Medica, etc., the role of golden inside chicken in dissipating stones is recorded in detail. The main components of Gallus gallus are protein, amino acid, polysaccharide, etc., and the inner wall of the sand sac of pheasants is the main source of these components [15].It was found that the mechanism of action of gallstone is through inhibiting the formation of calcium oxalate monohydrate in the kidney and destroying ionic compounds related to stone formation, thereby inhibiting stone formation, reducing the probability of stone formation, and alleviating kidney injury[16]. Foreign studies have found that fried chicken inner golden extract can significantly reduce the levels of oxalic acid and calcium in the urinary system, thereby reducing the incidence of related types of stones [17]. In addition, through data mining and literature research methods to analyze the prescriptions for the treatment of urinary calculi, it was found that the use frequency of chicken nuggets ranked in the top three, indicating the importance of chicken nuggets in the prevention and treatment of kidney stones [18-20].

1.3 Lygodium japonicum

Lygodium japonicum are sweet, salty and cold in nature, and belong to the bladder and small intestine channels in the twelve meridians.Lygodium japonicum is the mature spore of Thalassaceae plants.The latest research shows that Sea Sands is used to treat kidney stones through its characteristics of multiple components (such as farnesin, linarin, diisooctyl phthalate, apigenin, protocatechuic acid, p-coumaric acid, etc.), multiple targets (such as tumor protein p53, AKT1, Jun, etc.), and multiple pathways (such as proteoglycans, etc.)[21].Some researchers classified 20 groups of high-frequency traditional Chinese medicines into three categories for cluster analysis, and found

that Lygodium japonicum was clustered into one category[22].

1.4 Radix achyranthis bidentatae

Achyranthes bidentata has a flat, bitter and sour taste, and belongs to the kidney and liver meridians in the twelve meridians.Achyranthes bidentata is the root of Achyranthes bidentata, an Amaranthaceae plant. It contains saponins and is hydrolyzed to produce oleanolic acid.The main components of Achyranthes bidentata that exert its efficacy are sterones, triterpenoid saponins, polysaccharides, etc[23].Network pharmacology research shows that Achyranthes bidentata and its processed products can improve kidney injury to varying degrees by regulating the levels of body hormones and different components in serum[24].In addition, the latest experimental research abroad shows that the seed and leaf extracts of Achyranthes bidentata can naturally reverse antibiotic resistance without any side effects on human body[25-27].

1.5. Shiwei

Shiwei is sweet, bitter and slightly cold in nature. It belongs to the lung and bladder meridians in the twelve meridians.Shiwei, the dried leaf of the polypodial plant of Lushan Shiwei. The latest research abroad shows that Shiwei can regulate the levels of various factors in the body, inhibit the expression of related proteins, and then reduce the formation and development of uric acid, urinary calcium, etc. In addition, Shiwei extract can regulate the content of oxalate in urine, so as to reduce the probability of stone formation and development, and thus avoid the damage of stone kidney tissue[28]. Shiwei extract also has a better effect on repairing the damage of kidney tissue, and can reduce the relevant indicators in blood and urine of mice[29].

1.6 plantain seed

Plantain is sweet and cold in nature, and belongs to the liver, kidney, lung and small intestine meridians in the twelve meridians.Plantain is distributed all over the country. Its main producing areas include Jiangxi, Henan, Hebei, Sichuan and other places. It is a rare traditional Chinese medicine decoction piece for the prevention and treatment of urinary calculi, and its output is rich. It has a good effect in the prevention and treatment of urinary calculi. There are numerous studies on its effective components in clinical practice.Wang Tao and others have proved through experiments that the extract of Semen Plantaginis can regulate the level of renal cell apoptosis and regeneration in mice by regulating the protein level in mice, and then affect the renal function[30].Based on the lipidomics method, foreign researchers established a hyperuricemia model by intragastric administration of potassium oxyate, and explored the therapeutic mechanism of Semen Plantaginis extract on hyperuricemia rats, indicating that semen plantaginis has significant anti hyperuricemia, anti-inflammatory and renal protective effects[31].

2. Treatment of urinary calculi with traditional Chinese Medicine

Chenjunhui and others have proved through clinical trials that Chaiqin Decoction plus Shiwei powder has obvious therapeutic effect on urinary calculi[32].Fengtangbin and others have proved through clinical research that patients can take Sanjin Wuling Shaoyao Gancao Decoction orally during the treatment of urinary calculi, which can improve the stone expulsion rate of patients, save the hospitalization expenses of patients, and reduce the pain duration of patients. It has great clinical application value and is suitable for all patients with urinary calculi[33].Shimanqian proved that on the basis of promoting the excretion of urinary stones, Jinshi decoction can also better improve the

TCM constitution transformation score, TCM syndrome score and hematuria degree, and no obvious adverse reactions were found in the treatment, which is worthy of popularization and application[34]. Many researchers, such as zhayadong and Zeng Bishan, use self-made stone removing prescriptions, such as Huatan Sanjie Decoction and Sanjin decoction, which can effectively treat stones and improve pain symptoms[35-36],Through qualitative and quantitative research on the chemical composition and mechanism of shiletong granules, some studies have found that the key compounds in shiletong granules can inhibit the formation of calcium crystals through multiple target genes, such as VEGFA, PTGS2, EGFR, ESR1, ABCG2, and signaling pathways, reduce the excretion of oxalate and calcium, and regulate the level of uric acid, so as to play a role in the treatment of kidney stones[37].Through clinical research, wuhuibin has proved that Shenshitong granules, Qingyu Paishi granules, Sanjin Paishi granules and other Chinese patent medicines can effectively relieve the symptoms related to urinary stones, such as pain, hematuria, etc., effectively promote the discharge of stones, shorten the time of stone discharge, reduce the recurrence rate of urinary stones, and avoid the damage of urinary stones to the kidney[38].

3. Traditional Chinese medicine plays a significant role in the postoperative treatment of urinary calculi

Through clinical research, Liu Jun and others found that taking traditional Chinese medicine prescriptions can effectively reduce the duration of hematuria in patients after extracorporeal shock wave lithotripsy (ESWL), improve the stone clearance rate, reduce the number of lithotripsy in patients with ESWL, and reduce the length of hospital stay[39].Jinyuee and other researchers have shown that the application of Quyu Qingre Paishi prescription after ESWL can significantly reduce the levels of white blood cells and red blood cells in urine, as well as white blood cells and C-reactive protein in blood, and reduce the occurrence of urinary stone complications[40]. Yinjinge proved through the control experiment that the residual stone lesions in the renal calyces could be effectively removed by Paishi Decoction adjuvant treatment after the implementation of percutaneous nephrolithotomy (PNL) surgery in patients with kidney stones[41].Lihui found that Paishi decoction combined with PNL has a higher stone clearance rate in the treatment of kidney stones, which can significantly improve the expression level of urokinase and reduce inflammatory factors[42].Xiaozhiyong found that Xiaoji Yinzi had a significant effect in the treatment of postoperative hemorrhage in PNL[43].According to Chen Jing's research, Weijin Paishi decoction has better curative effect in treating kidney stones less than 2cm in diameter on the basis of oral use for the removal of residual stones after holmium laser lithotripsy under flexible ureteroscope[44]. Research has proved that the traditional Chinese medicine prescription has a significant effect on postoperative urinary calculi.Similarly, the latest foreign research has proved that for patients with complex kidney stones, oral administration of traditional Chinese medicine Paishi Decoction before laparoscopic ureterolithotomy can significantly shorten the stone removal time, reduce the related postoperative complications, and promote the recovery of renal function[45].In addition, the addition and subtraction of "Xiaoxuming Decoction" for patients with indwelling stents after urinary calculi surgery can significantly improve common complications such as hematuria, bladder irritation, low back pain and abdominal pain, with significant clinical efficacy and no obvious side effects[46].

In traditional Chinese medicine, there are a lot of words about stone drenching (urinary stones). For example, according to the "wings of the Golden Chamber: all drenching" written by you Yi of the Qing Dynasty, "at the beginning, it will be hot drenching and blood drenching, and for a long time, it will be boiling water, thick as paste, as sand and as stone.". If the stone is large and the ureteral wall is damaged during stone discharge, the patient will suffer from colic; Even the stones

are incarcerated, blocking the urethra, causing interruption of urination, inability to excrete urine, abdominal distension and pain for a long time, and even damaging the kidney; The stones are small, or stay in the kidney, without obvious discomfort in the short term, and cause local inflammation for a long time, and even affect organ function. In addition, with the continuous improvement of modern living standards and the improvement of people's diet, the incidence of hyperlipidemia and diabetes mellitus has increased year by year, which are also important predisposing factors for urinary stones and kidney stones. At this time, effective, cost-effective and less side effects of traditional Chinese medicine are the only choice for patients. The above traditional Chinese medicine has clear pharmacological effects and curative effects on these diseases, and is suitable for the treatment of urinary stones in clinic. We look forward to more people's in-depth research and Discussion on these drugs, so as to benefit more patients as soon as possible.

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