ORIGINAL RESEARCH ARTICLE

Clinical effects of a Chinese herbal medicine on patients with chronic renal failure

DOI: 10.29063/ajrh2025/v29i5s.10

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Abstract

This study assessed the impact of experienced prescription by Chinese medical master Zou Yanqin on chronic renal failure (CRF) patients. One hundred and twenty CRF patients admitted in Affiliated Hospital of Nanjing University of Chinese Medicine from January 2021 to December 2022 were randomly separated into a control group (CG) and a study group (SG). The CG accepted conventional therapy while the SG accepted treatment with Zou Yanqin prescription in addition to conventional treatment. The results showed that relative to CG, the SG had better total treatment effectiveness rate, lower serum creatinine as well as blood urea nitrogen levels, higher creatinine clearance rate, lower levels of inflammatory markers, higher serum albumin, hemoglobin and transferrin levels and lower incidence of adverse reactions. We conclude that experienced prescription by Chinese medical master Zou Yanqin can enhance the clinical treatment effect of conventional treatment, inhibit the inflammation, improve the nutritional status, and is safe for CRF patients. *(Afr J Reprod Health 2025; 29 [5s]: 81-88)*

Keywords: Chronic renal failure, traditional Chinese medicine, kidney function, inflammatory response, nutritional status

Résumé

Cette étude a évalué l'impact de la prescription expérimentée du maître chinois Zou Yanqin sur les patients atteints d'insuffisance rénale chronique (IRC). Cent vingt patients atteints d'IRC admis à l'hôpital affilié de l'Université de médecine chinoise de Nanjing entre janvier 2021 et décembre 2022 ont été répartis aléatoirement en un groupe témoin (GT) et un groupe d'étude (GE). Le GT a accepté un traitement conventionnel, tandis que le GE a accepté un traitement sur prescription de Zou Yanqin en complément du traitement conventionnel. Les résultats ont montré que, par rapport au GT, le GE présentait une meilleure efficacité globale du traitement, des taux de créatinine sérique et d'urée sanguine plus faibles, une clairance de la créatinine plus élevée, des taux de marqueurs inflammatoires plus faibles, des taux d'albumine sérique, d'hémoglobine et de transferrine plus élevés, ainsi qu'une incidence plus faible d'effets indésirables. Nous concluons que la prescription expérimentée du maître chinois Zou Yanqin peut renforcer l'efficacité clinique du traitement conventionnel, inhiber l'inflammation, améliorer l'état nutritionnel et est sans danger pour les patients atteints d'IRC. *(Afr J Reprod Health 2025; 29 [5s]: 81-88).*

Mots-clés: Insuffisance rénale chronique, médecine traditionnelle chinoise, fonction rénale, réponse inflammatoire, état nutritionnel

Introduction

Chronic kidney disease (CKD) belongs to a chronic disorder of kidney structure and function instigated by various causes.[1] With the advancement of modern society and economy along with the alteration of people's living and eating habits, CKD has gradually developed into a global public health issue with high prevalence.[2] CKD patients may develop chronic renal failure (CRF) due to progressive reduction in renal function until failure.[3] The causes of CRF are primary and secondary glomerulonephritis, followed by congenital malformations of the urinary system, hereditary diseases, and systemic diseases.[3] However, the onset of the disease is insidious, the early clinical symptoms of the patient are not apparent, and the laboratory indicators of the disease are not parallel to the clinical manifestations. The patient may have skin itching, nausea, retching, insomnia and other symptoms. When the patient has nausea, vomiting and other symptoms, these suggest that the disease is in the late stage, and the kidney

function has declined severely, which seriously affects patients' quality of life.[4] With further aggravation of the disease, CRF develops into end-stage renal disease (ESRD), which is the final stage of CDK, which is characterized by the gradual accumulation of uremic toxin, which poses a great threat to the quality of life and even life safety of patients.[5]

At present, the treatment of this disease in Western medicine is mainly to control the primary disease and prevent and treat complications, which can improve hypertension, dyslipidemia, water and electrolyte disorders, anemia, etc. to a certain extent, but cannot curb the development momentum of the disease.[6] When the disease progresses to ESRD, kidney replacement therapy containing dialysis or kidney transplantation can be selected to prolong life, which can promote the survival rate of some ESRD patients, but many complications and risks remain unavoidable.[7] Hence, it is essential to seek effective treatment for early and middle CRF and control its development into ESRD.

Recently, traditional Chinese medicine (TCM) has shown apparent advantages in improving the clinical manifestations of CRF patients, reducing the serum creatinine level and delaying the time of patients entering dialysis.[8] TCM believes that CRF is a clinical disease caused by the prolongation of various kidney diseases and the development to the terminal stage, and its pathogenesis are complex, and renal failure and retention of turbid bane are the basic pathogenesis.[9] Previously, Professor Zou applied Chinese herbal medicine Suyin Detoxification Granule in a rat model of renal failure, and discovered that Suyin Detoxification Granule improved renal function and proteinuria, alleviated renal fibrosis, and reduced serum inflammation in the kidney of rats.[10] However, the impact of experienced prescription by Chinese medical master Zou Yanqin on CRF patients remains unclear.

Therefore, our study planned to assess the impact of experienced prescription by Chinese medical master Zou Yanqin on CRF patients. The novelty of our study was that we proved that experienced prescription by Chinese medical master Zou Yanqin could enhance the clinical treatment effect of conventional treatment, inhibit the inflammation, improve the nutritional status, and is safe for CRF patients.

Methods

Materials

One hundred and twenty CRF patients accepted therapy in Affiliated Hospital of Nanjing University of Chinese Medicine from January 2021 to December 2022. They were randomly divided into a control group (CG) and a study group (SG), with each group having 60 patients. The patients signed informed consent forms.

The inclusion criteria were: (1) patients who were confirmed with imaging examination to have met the diagnostic criteria for CRF; (2) those with good compliance, communication and cognitive skills; (2) patients with complete clinical data; and (4) patients with expected survival > 2 years.

The exclusion criteria were: (1) patients who had cardiovascular and cerebrovascular diseases; (2) those with malignant tumor; (3) patients with allergic conditions; (4) those with severe infection; (6) patients had acute renal failure; and (7) patients who had accepted relevant treatment within 3 months before enrollment.

As shown in Table 1, there was no significant difference in socio-demographic characteristics between the two groups (P>0.05, Table 1).

Methods

The CG received conventional treatment for CRP consisting of low-salt, low-fat, and high-quality low-protein diet. Their blood pressures were controlled, infections were treated, and electrolyte disorders andacidosis were corrected. Their renal functions were protected by improvement of renal microcirculation, and the avoidance of dehydrationand nephrotoxic drugs. At the same time, patients took Shenshuaining granules which were used to treat chronic renal insufficiency[11] with boiled water (Manufacturer: Shanxi Deyuantang Pharmaceutical Co., LTD.; Specification: 5 g per bag), 1 bag/time, 3 times /d.

In addition to the above therapy given to the CG, the SG received experienced prescription by

Table 1: General information of patients in 2 groups (x±s)/n (%)

Items		Control group (n=60)	Study group (n=60)	*P*
Gender (male/female)		30/30	28/32	>0.05
Age (years)		44.56±4.35	44.58±4.38	>0.05
Primary diseases	Uric acid kidney disease	10	11	>0.05
	Chronic nephritis	34	35	
	Diabetic nephritis	7	6	
	Hypertensive kidney injury	9	8	
Grade of renal function	Grade I	7	8	>0.05
	Grade II	15	14	
	Grade III	27	28	
	Grade IV	11	10	

Chinese medical master Zou Yanqin. The drug composition consisted of Duan Xu [teasel root], Sang Ji Sheng [parasitic loranthus], Sheng Huang Qi [raw astragalus], Bai Shu [white atractylodes rhizome], Yin Chen [oriental wormwood], Pu Huang [pollen typhae], Wu Ling Zhi [trogopterus dung], Che Qian Zi [semen plantaginis], Shu Da Huang [cooked rhubarb], Ji Xue Cao [centella], and Tu Fu Ling [glabrous greenbrier rhizome]. The prescription was modified according to the symptoms of patients: For patients with spleen deficiency (Insufficient qi and blood and spleen dysfunction caused by many factors such as diet, lifestyle, mental and disease),[12] astragalus and codonopsis were added. For patients with Yin deficiency (Human body fluid deficiency, unable to maintain normal physiological function and form a pathological state),[13] rhizoma anemarrhenae and ophiopogon japonicas were added; For patients with turbid phlegm, caulis bambusae in taeniam and pinellia ternate were added. For patients with insufficiency of the kidney-yang (Lack of motivation for kidney physiological function),[14] aconite and cinnamon were added and for patients with deficiency of kidney-yin, glossy privet and radix glehniae were added. One dose per day, 300 mL of liquid decocted in water, divided into 2 times of oral administration, 2 months for 1 course of treatment.

Observed indicators

(1) Efficacy criteria: Obvious effect: the patient's previous clinical symptoms disappeared or were significantly reduced. Blood creatinine level was decreased by more than 30% or endogenous creatinine clearance level was increased by more than 30%. Effective: the clinical symptoms of patients were reduced. Blood creatinine level was decreased by more than 20% or endogenous creatinine clearance level was increased by more than 20%. Ineffective: Patients who did not meet the above criteria were regarded as ineffective treatment. Total effectiveness rate = Obvious effect rate + Effective rate.

(2) Kidney function. 4 mL of fasting venous blood was obtained, and sera was obtained for test. Serum creatinine (SCr) along with blood urea nitrogen (BUN) levels were measured by help of automatic biochemical analyzer. Creatinine clearance rate (CCr) was calculated.

(3) Inflammatory response. The serum levels of interleukin-6 (IL-6), interleukin-8 (IL-8), along with tumor necrosis factor-α (TNF-α) were measured by means of enzyme-linked immunosorbent assay (ELISA, Shanghai Enzyme Linked Biotechnology Co., LTD).

(4) Nutritional status. Serum albumin (ALB), hemoglobin (HGB) and transferrin (TRF) levels were detected by ELISA.

(5) Incidence of adverse reactions containing gastrointestinal reactions, nausea and vomiting as well as loss of appetite in 2 groups was compared.

Statistical analysis

SPSS 11.0 statistical software was adopted for data analysis. Measurement data exhibited by (x±s) were compared by t test. Count data exhibited by n (%) were analyzed the χ^2 test. $P<0.05$ meant the difference was statistically significant.

Ethical consideration

This study was consistent with the ethical standards of the 1964 Declaration of Helsinki and its later amendments, and was approved by the Ethics Committee of Affiliated Hospital of Nanjing University of Chinese Medicine on July 22, 2024, and the ethics approval number was 2024NL-199-02.

Results

Therapeutic effect in 2 groups

Table 2 indicated that the total effective rate of the SG (96.67%) was higher than that of the CG (71.67%), with statistical significance (P<0.05).

Kidney function in both groups

Figure 1 showed no difference in SCr, BUN and CCr levels before therapy ($P>0.05$) between the CG and SG. After therapy, SCr and BUN levels declined in both groups; however, those in the SG [(213.73±21.76) μmol/L and (8.17±0.83) mmol/L] were significantly lower compared to the CG [(246.45±24.48) μmol/L and (10.64±1.05) mmol/L] ($P<0.05$). Meanwhile, CCr was higher in the groups after therapy; however, that in the SG [(39.38±4.01) ml/min] was higher compared to the CG [(34.52±3.42) ml/min] ($P<0.05$).

Table 2: Therapeutic effect in both groups n (%)

Groups	Cases	Obvious effect	Effective	Ineffective	Total effective rate
Study group	60	35 (58.34)	17 (28.33)	8 (13.33)	52 (86.67%)
Control group	60	26 (43.34)	17 (28.33)	17 (28.33)	43 (71.67%)
χ^2					4.09
P					<0.05

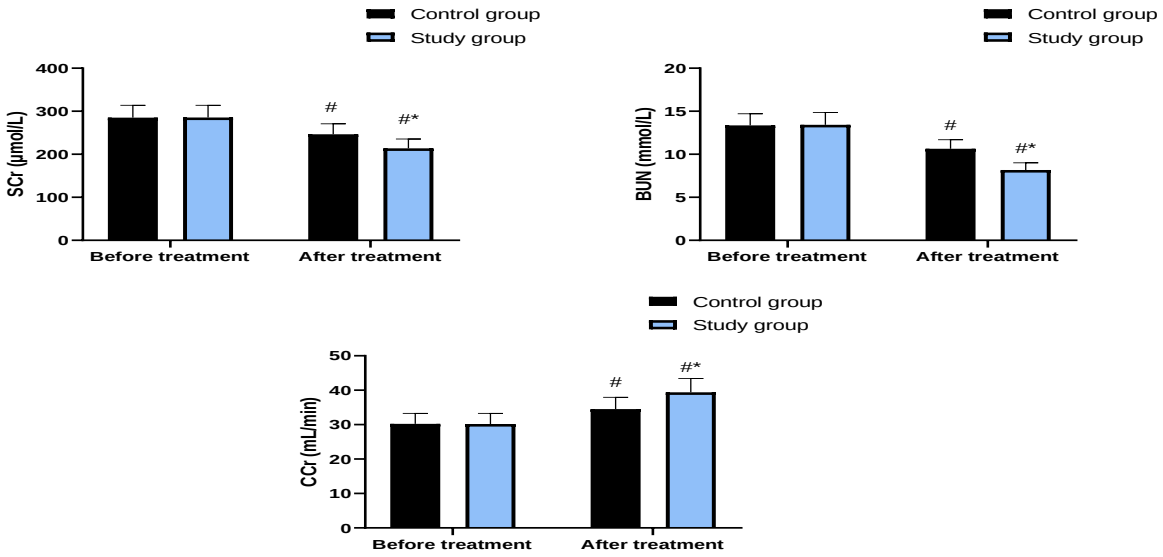

Figure 1: Kidney function in both groups. #*P*<0.05, compared with before therapy. *P<0.05, compared with control group

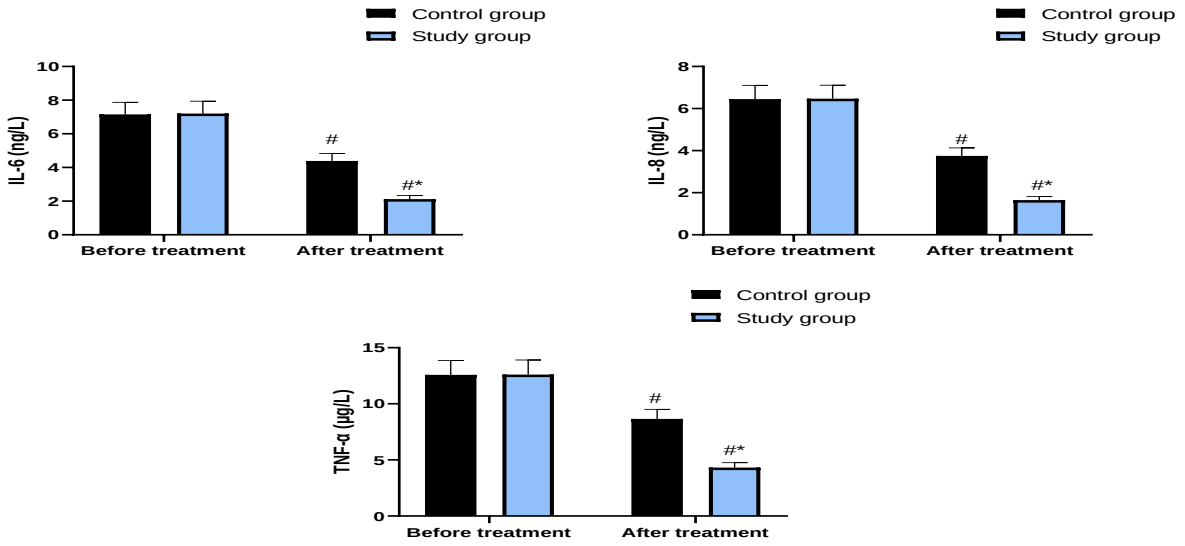

Figure 2: Inflammatory response in both groups. #*P*<0.05, compared with before therapy. **P*<0.05, compared with control group

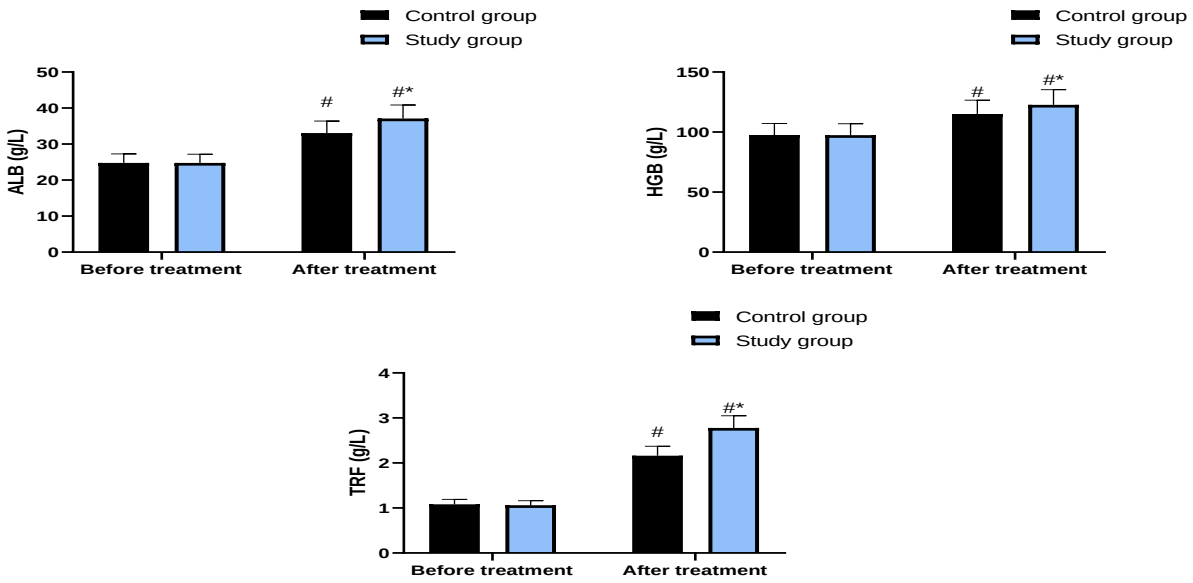

Figure 3: Nutritional status in both groups. #*P*<0.05, compared with before therapy. **P*<0.05, compared with control group

Table 3: Incidence of adverse reactions in both groups n (%)

Groups	Cases	Gastrointestinal reactions	Nausea and vomiting	Loss of appetite	Total incidence rate
Control group	60	4 (6.67)	3 (5.00)	5 (8.33)	12 (20.00%)
Study group	60	2 (3.33)	1 (1.67)	1 (1.67)	4 (6.67%)
χ^2					4.62
P					<0.05

Inflammatory response in both groups

Figure 2 show that no difference was found in IL-6, IL-8 and TNF-α levels before therapy (P>0.05). After therapy, IL-6, IL-8 and TNF-α levels declined in both groups; however, those in the SG [(2.12±0.22) ng/L, (1.65±0.17) ng/L and (4.32±0.43) μg/L] were lower compared to the CG [(4.39±0.44) ng/L, (3.75±0.38) ng/L and (8.65±0.86) μg/L] (P<0.05).

Nutritional status in both groups

Figure 3 show that no difference was found in ALB, HGB and TRF before therapy (P>0.05). However, ALB, HGB and TRF were increased in both groups after therapy, but those in the SG [(37.12±3.73) g/L, (122.64±12.65) g/L and (2.78±0.27) g/L] were significantly higher compared to the CG [(33.07±3.32) g/L, (115.03±11.52) g/L and (2.16±0.21) g/L] (P<0.05).

Incidence of adverse reactions in both groups

Table 3 indicated that relative to the CG, the SG had lower incidence of adverse reactions (P<0.05).

Discussion

CRF is mainly caused by glomerulonephritis, and can also be caused by diseases such as diabetes, drug-induced nephropathy, obstructive nephropathy, hypertension, and hereditary nephropathy.[15] If CRF patients are not treated in a timely and effective manner, toxins will accumulate in the body and kidney damage will be serious, thus increasing the difficulty of clinical treatment and threatening the life and health of patients.[16] At present, Western medicine is commonly used in clinical treatment of CRF, which can promote the acid-base balance of the kidney, reduce the damage of the kidney, and protect the kidney function, but the effect of western medicine in some patients is not ideal.[17]

Traditional Chinese Medicine classifies CRF into the categories of "Nidu" and "difficulty in urination," and believes that the disease is mainly caused by external abnormal changes of weather and improper diet and overstrain, leading to the weakness of function of the spleen and kidneys and insufficiency of vital energy and blood.[18] The therapy should focus on elevating blood circulation and removing blood stasis and strengthening spleen and qi.[19] Experienced prescription by Chinese medical master Zou Yanqin is composed of teasel root, parasitic loranthus, raw astragalus, white atractylodes rhizome, oriental wormwood, pollen typhae, trogopterus dung, semen plantaginis, cooked rhubarb, centella, and glabrous greenbrier rhizome, which has the function of relieving kidney deficiency.[10]

Based on modern pharmacological studies, raw astragalus can effectively control proteinuria of chronic primary glomerulopathy patients, and can help stabilize their conditions with less adverse reactions,[20] while oriental wormwood has a protective effect against stress-induced hepatic injury through regulating IL-1β and IL-10 cytokines,[21]. Pollen typhae can significantly improve BUN level, urine volume along with kidney index in acute kidney injury rats.[22] Besides, it has been demonstrated that plantaginis semen polysaccharides relieves renal damage through modulating NLRP3 inflammasome in gouty nephropathy rats,[23] and centella asiatica represses renal interstitial fibrosis by modulating Smad3 and Smad7 expression.[24]

In our study, the outcomes suggested that relative to the CG, the SG had better total treatment effectiveness rate, lower SCr and BUN levels and higher CCr, implying that experienced prescription by Chinese medical master Zou Yanqin could improve clinical efficacy, renal function of patients with CRF, which was in line with previous studies,[8,25] highlighting the important role of TCM in treating CRF.

Additionally, studies have pointed out that CRF patients are mostly in a state of micro-inflammation.[26] TNF-α is currently recognized as a type of the inflammatory factors that cause acute injury.[27] IL-6 and IL-8 are also important pro-inflammatory factors.[28] Besides, our outcomes manifested that after therapy, relative to the CG, the SG had lower IL-6, IL-8, along with TNF-α levels, indicating that experienced prescription by Chinese medical master Zou Yanqin could reduce the level of pro-inflammatory factors, which was in accordance with the relevant study.[29]

Due to metabolic product retention, water, electrolyte, acid-base imbalance and other reasons, CRF patients are prone to anorexia, nausea, vomiting and other symptoms, resulting in nutritional imbalance and requiring long-term diet control and drug treatment.[30] Therefore, malnutrition is a well-recognized problem in patients with CRF.[27] Moreover, our study indicated that after therapy, ALB, HGB and TRF were elevated in both groups, and those in the SG presented higher relative to the CG, suggesting that experienced prescription by Chinese medical master Zou Yanqin could enhance the nutritional status of CRF patients. Consistently, it has been documented that TCM has the effect of promoting the nutrition status in the treatment of CRF.[31] In addition, the incidence of adverse reactions in the SG was lower than that in the CG, implying that experienced prescription by Chinese medical master Zou Yanqin is safe, which was similar to previous literature.[32]

Strengths and limitations

Strengths of this study include the use of a validated outcome measure, and our study may provide a valuable treatment method for patients with CRF. There are some limitations in this study. Firstly, the small number of participants does not exclude the possibility that the statistical results were due to chance. In addition, the experimental period was short and there was a lack of long-term follow-up results. The current research team needs to conduct a controlled clinical trial to further confirm the value of experienced prescription by Chinese medical master Zou Yanqin in CRF.

Conclusion

Experienced prescription by Chinese medical master Zou Yanqin can promote the clinical treatment effect, inhibit the inflammatory response, improve the nutritional status, and has a good safety for patients with CRF, which is worthy for clinical application.

Competing interests

The authors report no actual or potential conflicts of interest.

Funding

This work was supported by the Project of China Academy of Chinese Medical Sciences (No. CI2022E021XB).

Contribution of authors

Hui Bu and Xinyi Shen: conceived and designed the study, as well as collected and analysed the data. Hui Bu and Yanqin Zou: prepared the manuscript. All authors mentioned in the article approved the manuscript.

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