



CASE REPORT

Managing Chronic Kidney Disease and Chemotherapy-Induced Peripheral Neuropathy with Acupuncture and Herbal Medicine: A Case Study

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Abstract

This case study details the treatment of a 59-year-old male with Stage 3B chronic kidney disease (CKD) and chemotherapy-induced peripheral neuropathy of the left limbs using acupuncture and bulk herbs. After 6 weeks of combined acupuncture and herbal treatments, glomerular filtration rate increased significantly from 37 mL/min to 51 mL/min and serum creatinine level decreased from 1.85 mg/dL to 1.41 mg/dL. After a course of 15 acupuncture treatments over 4 months with some appointments in closer proximity, the patient additionally reported increased sensation of his left limbs. Since there are limited treatments for CKD, others with CKD may benefit from acupuncture and herbal treatments. This study offers an approach to managing CKD and chemotherapy-induced peripheral neuropathy more effectively using herbs and acupuncture supported by biomedical verification results.

1. Introduction

Chronic kidney disease (CKD) is considered to be a global health problem [1]. The numbers of CKD patients with a

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corollary of end-stage renal disease have increased in all countries [2]. As CKD progresses, uremia, high blood pressure, anemia, bone disease, poor nutritional health, and nerve damage may develop [1]. CKD is commonly associated with cardiovascular disease and diabetes where cardiovascular disease is both a cause and a complication of CKD [3]. Recent studies have found that complications and comorbidities occur more commonly with CKD [4,5] CKD is a risk factor for adverse outcome of cancer [3,4]. Cancer can cause CKD either directly or indirectly through adverse effects of cancer therapies and CKD may conversely be a risk factor for cancer [4,5].

The National Kidney Foundation defines CKD as “kidney damage for three or more months as defined by structural or functional abnormalities of the kidney, with or without decreased glomerular filtration rate (GFR) or estimated GFR < 60 mL/min/1.73 m² for 3 or more months, with or without kidney damage” [1]. The normal range for GFR is 90–120 mL/min. The GFR decreases with age and is essential for the diagnosis and management of CKD. There are five stages of CKD: Stage 1, GFR > 90 mL/min/1.73 m² (normal); Stage 2, GFR 60–89 mL/min/1.73 m² (mild); Stage 3, GFR 30–59 mL/min/1.73 m² (moderate); Stage 4, GFR 15–29 mL/min/1.73 m² (severe); and Stage 5, GFR < 15 mL/min/1.73 m² (kidney failure) [1]. The level of serum creatinine is another indicator of renal function. Creatinine is a byproduct generated from muscle metabolism, removed from the blood and excreted by the kidneys [1]. A creatinine level > 1.4 mg/dL for men may indicate kidney dysfunction [1].

Chemotherapy-induced peripheral neuropathy (CIPN) occurs in 20–100% of patients with cancer and is a direct result of sensory, motor, and autonomic nerve injury [6,7]. CIPN commonly includes uncomfortable and often painful sensations described as burning, numbness, stabbing, pricking, tingling, sharpness, shooting, or electric-shock-like [6]. In most cases, neuropathy signs and symptoms first become apparent in the toes [8]. Symptoms progress proximally from the toes to the feet, ankles, and then calves [8]. Extension to the fingers, hands, wrists, and then arms indicates severe neuropathy and usually occurs after CIPN has been well-established in the lower extremities [9].

Acupuncture and herbs may help manage CKD and subsequently be helpful in managing CIPN [10]. From the view of East Asian medicine (of promoting physiological function), by strengthening and regulating postnatal (Spleen/Stomach) and prenatal (Kidney) *qi*, the body is able to provide increased perfusion of *qi* and blood to the extremities. Studies of *Dang gui* and *Huang qi* show that these two herbs can lower proteinuria, retarding the progression of renal fibrosis [10–12]. Studies showed that acupuncture decreased sympathetic nerve activity in the kidneys, and lowered serum creatinine and blood pressure through modulation of endothelial nitric oxide [13,14].

2. Case Presentation

A 59-year-old male patient presented with the chief complaints of CKD and CIPN of the left hand and leg on December 19, 2013. In 2012, he was diagnosed with decreased kidney function and borderline CKD with a GFR < 60 mL/min. Previously, he had been diagnosed with colorectal cancer in 2008 and underwent a colectomy, reconstructive surgery of the left ureter and chemotherapy. He had been in remission since his last chemotherapy in 2010. He has a family history of hypertension and was diagnosed with stage 1 hypertension prior to the cancer diagnosis. The patient’s main concern was declining kidney function which would require hemodialysis. He had started graduate school shortly after finishing chemotherapy treatment and was concerned that he would not be able to finish graduate school with worsening symptoms. The onset of neuropathy started on the sole of his left foot, which preceded

Table 1 Pre-treatment and post-treatment urinalysis results after 6 weeks of combined herbal (Dang Gui Bu Xue Tang) and acupuncture treatments.

Urinalysis measurements	Pre-treatment	Post-treatment	Change in value
Glomerular filtration rate (mL/min)	37	51	+ 14
Creatinine (mg/dL)	1.85	1.41	– 0.44

neuropathy of his left hand. At first, he experienced numbness and tingling on his left sole. Subsequently, his left hand felt considerably weak and numb, especially on the palmar aspect. He reported that the numbness and weakness had adversely affected activities of daily living such as opening bottles. To alleviate CIPN and other chemotherapy-related side effects, he began receiving acupuncture treatments in 2011. Previously, the patient was also prescribed *Jin Gui Shen Qi Wan*, a common Kidney *yang* tonic formula modified from *Liu Wei Di Huang Wan* with the addition of *Gui zhi* and *Fu zi*. However, the patient reported previous treatments did not improve kidney function.

The patient complained of somnolence, fatigue, coldness, poor memory, fecal incontinence, tinnitus, and erectile dysfunction, which points to Kidney *yang* deficiency [15]. On palpation, his hands and feet felt colder than other areas of his body. The right distal and middle pulse positions were slippery, and the proximal position was weak and thin. The left pulse was choppy on all three positions with the proximal position thin and choppy. His tongue was pale dusky with a red tip, cracks on the side and in the center, and a dry thick white coat. The sublingual veins were dark and slightly distended, the left side more distended than the right. After his last urinalysis in October 2013, his primary care physician prognosed that the patient would need hemodialysis in the following year. The patient agreed to get a urinalysis in January 2014 to establish a new baseline before taking herbal medicine. The urinalysis revealed GFR of 37 mL/min and creatinine level of 1.85 mg/dL or stage 3B CKD.

From December 19, 2013 to March 25, 2014, the patient was treated 15 times using a modified Korean four-needle (SaAm) technique with LU9 and SP3 to move blood combined with ST36, KID-3, TE4, CV6, *Yintang* EX-HN3, and GV20 to strengthen *qi* as presented in Table 2. Each treatment lasted 30–40 minutes with insertion always starting on the right side so the patient could compare

Table 2 Selection of acupuncture points.

Area of body	Acupuncture points and Insertion order		
(1) Right limbs	LU9	SP3	
(2) Bilateral (right to left)	ST36	KI3	TE4
(3) Midline	CV6	<i>Yintang</i> EX-HN3	GV20

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