

Acute Kidney Injury Induced by Herbal Products: A Case Report

Bitkisel Ürünlerle Bağlı Akut Böbrek Yetmezliği: Olgu Sunumu

ABSTRACT

Recently, consumption of herbal products has become widespread both in Turkey and worldwide. However, the safety of these products is substantially controversial. We here present a case of acute kidney injury in a patient with excessive use of herbal products for cardio-protective purposes.

KEY WORDS: Herbal product, Tribulus terrestris, Acute kidney injury

ÖZ

Son yıllarda bitkisel ürünlerin dünyada ve ülkemizde de kullanımı her geçen gün artmaktadır. Bununla birlikte bu ürünlerin güvenilirliği tartışma konusudur. Burada kardiyovasküler korunma amaçlı oldukça fazla bitkisel ürün kullanan, akut böbrek yetmezliği ile kliniğimize kabul ettiğimiz bir olgu sunulmaktadır.

ANAHTAR SÖZCÜKLER: Bitkisel ürün, Tribulus terrestris, Akut böbrek yetmezliği

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INTRODUCTION

Recently, consumption of various herbals and/or herbal products for protection against diseases and alleviation of disease effects has become widespread (1,2). Although there is inter-community variation World Health Organization has reported that 70-80% of the world population uses herbal products in addition to basic healthcare services (1). However, the safety of these products is substantially controversial. Chronic kidney disease (CKD) is an epidemic issue that becomes increasingly common. Studies have demonstrated that the frequency of herbal product usage ranges between 25 and 37% in these patients in Turkey (3-5). The pharmacokinetic role of these products in CKD is not known exactly; however it is commonly accepted that they cause hazardous effects.

We present a case of acute kidney injury presenting to the emergency department in a patient with excessive use of herbal products for cardio-protective purposes and history of mild CKD.

CASE

A 50 year-old female patient presented to the emergency department with complaints of nausea and vomiting. Medical history revealed hypertension and type 2 diabetes mellitus for 15 years, CKD for one year, and right nephrectomy operation due to nephrolithiasis 22 years ago. Medical treatment of the patient consisted of valsartan plus hydrochlorothiazide 160/12.5 mg, atorvastatin 20 mg/day and insulin. Emergency laboratory examinations revealed that serum urea was 72 mg/dL and creatinine was 3.6 mg/dL, and the patient was therefore internalized with a pre-diagnosis of acute-on-chronic kidney disease. Her blood pressure was 120/80 mmHg, body temperature was 36.5°C and physical examination was basically normal. Complete urine examination and urine microscopy were also normal. Sodium level and FeNa were measured to be 55 meq/dL and 1.8%, respectively in the spot urine sample. On serum biochemical analysis, the patient's serum glucose was 180 mg/dL,



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sodium was 136 mmol/L, potassium was 3.6 mmol/L, alanine aminotransferase (ALT) was 19 U/L (<40), and creatinine kinase (CK) was 120 U/L (26-192). Her hemoglobin level was 12 g/ dL and no leukocytosis or eosinophilia was present. Venous blood gases revealed a pH of 7.44, a pCO₂ of 32 mmHg, and a HCO₃ of 22 mmol/L. Kidney sizes, parenchymal thickness and width of collective ducts were normal in left kidney on urinary ultrasound. Hba1c was 6.9% and urine microalbumin was 2.83 mg/day on laboratory examinations performed in the last 3 months for diabetic follow-up. Elaboration of medical history disclosed that the patient had been using 4 different combination herbal medicinal products for cardio-protective purposes twice a day for 2 two weeks. Patient also expressed that her complaints emerged one week after she started these herbals. The clinical picture therefore was thought to be etiologically associated with these herbal products, the content of which were demonstrated in Table I. Valsartan plus hydrochlorothiazide and statin therapies were ceased. Saline infusion was started with a fluid balance target of 500 ml. The diuresis of the patient on the first and second days of hospitalization were 800 ml/ day and 2000 ml/ day, respectively. During the hospital follow up, serum creatinine levels regressed to 1.5 mg/dl from an initial of 3.6 mg/dl. Figure 1 demonstrates serum creatinine values during the hospital follow up. The patient was observed in good general condition and was free of complaints in the follow-up and she was discharged to be followed in the nephrology outpatient clinic.

DISCUSSION

Recently, consumption with herbal products has become widespread both in our country and worldwide (1,2). Use of these products has become an important public health issue due to the lack of adequate pharmacological studies and protective measures. Epidemiological studies have demonstrated that the frequency of herbal product usage is 25-37% in patients with CKD in Turkey (3-5). Similarly, one study on dialysis patients has reported that herbal products are used in 30% of these

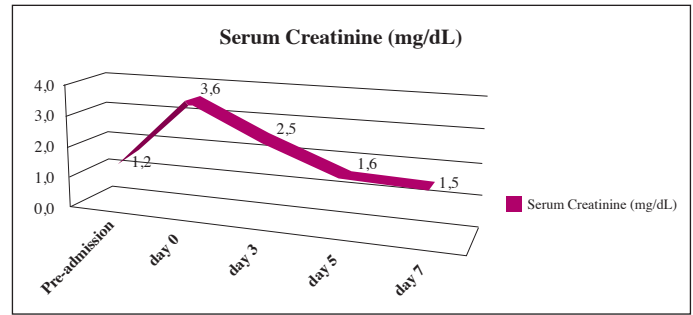


Figure 1: Serum creatinine levels in the patient during the follow up period.

patients (3). Interestingly, the patients had not informed their physicians on their use of these products in great majority of these studies. Our patient had also not informed her physician and obtained counseling regarding her use of several herbal products.

The pharmacokinetics of herbal products might alter in the presence of renal failure and these products might cause toxic side effects (6). Additionally, herbal products might interact with the numerous medicines received by patients with CKD. Certain herbal products might also have direct nephrotoxic side effects (7,8). Herbal products with renal adverse effects reported in literature is listed in Table II. Tribulus terrestris is a flowered herb that grows in many parts of the world. This herb is commonly used in a number of diseases including coronary arterial disease, hypertension, diabetes, nephrolithiasis and sexual dysfunction for its vasodilator effect (9,10). Animal experiments have demonstrated that it exhibits the vasodilator effect by decreasing the activity of renal angiotensin-converting enzyme(10). Renal adverse effects of Tribulus have been reported in literature. In their case presentation, Talasaz et al. have reported hepatotoxicity, neurotoxicity, and severe nephrotoxicity necessitating dialysis (8). Our case also received several herbal products including Tribulus terrestris. Not only the direct nephrotoxic effect of these herbal products but also their interaction with the angiotensin receptor blocker already received by the patient were thought to be responsible in the etiology of the acute kidney injury in our patient.

Table I: List of herbal products used by the patient.

Tribulus terrestris	Zingiber officinale
Avena Sativa	Curcuma longa
Panax ginseng	Euqenia caryophyllata
Gymnema extract	Glycyrhiza glabro
Gymnema sylvestre Leaf	Lavandula cariensis
Balsam Apple extract	Allivn satium
Momordica charantia	Rhamnus chaterticus
Cinnamomum sp.	Crataegus
Cinnamon bark powder	

Table II: Potential nephrotoxic products and their mechanisms of effect.

Product	Potential nephrotoxic effect
<i>Aristolochia spp.</i>	Renal interstitial fibrosis
<i>Tripterygium wilfordii</i>	Tubular obstruction
<i>Tribulus terrestris</i>	Acute tubular necrosis
Herbal products containing heavy metals (such as lead, mercury, cadmium, and arsenic)	Acute tubular necrosis Chronic interstitial nephritis

Acute kidney injury due to herbal remedies may occur through various mechanisms (7). Acute tubular necrosis as well as acute interstitial nephritis may be the responsible mechanism for the development of acute nephropathy. It is sometimes difficult to differentiate these two, although absence of skin rash, arthralgia, eosinophilia, and pyuria favors the diagnosis of acute tubular necrosis. A renal biopsy therefore is required for a clear distinction. In this case, however, a biopsy was not attempted since the patient has a solitary kidney.

Consequently, nephrotoxic side effects might be observed due to consumption of herbal products in patients with CKD. Potential use of herbal products must be questioned in the etiological assessment of acute kidney injury of unknown etiology in such patients.

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